THE IMPLICATIONS OF AN AGE OF ONSET DISTINCTION FOR THE PRESENTATION AND TREATMENT OF LATE- LIFE GENERALISED ANXIETY DISORDER

Maaria Haque

A thesis submitted for the degree of Doctor of Philosophy (in Clinical Psychology) from The Australian National University

Research School of Psychology

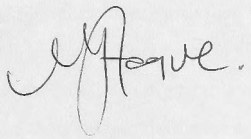
The Australian National University

Canberra, A.C.T. Australia

October 2013

DECLARATION

I declare that this thesis reports my original work, that no part has been previously accepted and presented for the award of any degree or diploma from any university and that to the best of my knowledge, no material previously published or written by any other person is included, except where due acknowledgement is given.



Maaria Haque

ACKNOWLEDGEMENTS

I wish to thank the following people for contributing to the completion of this thesis:

Associate Professor Richard O'Kearney, for his generous support and guidance throughout my candidature. I am grateful for the feedback and suggestions provided, and for his patience in seeing me through this very long process.

Dr Michael Bird for the ample feedback, guidance and support constantly provided whilst undertaking this research degree, and for his timely words of encouragement. I'm also grateful for his support in my interest in working with older adults not only from a research perspective but clinically, and for guiding my professional development in the area of ageing throughout my candidature.

Michael Smithson, whose generous assistance with the statistical analysis was greatly appreciated and an invaluable contribution to the research.

Ms Kate Hogan, Ms Caroline Twang and Ms Jenny Sutton for their readiness to offer support and assistance throughout this process.

The School of Psychology Technical Staff, Shane Pozzi, Alan Lucas, Petrina Daniel and Mary Dalton, for their infinite wisdom on all things technical and their patience in sharing this knowledge with me. In particular, a special thanks to Mary for her valuable knowledge, time and effort in obtaining and setting up laboratory equipment for me and teaching me about the software.

My friends, all of whom have provided endless support and encouragement over the years. I look forward to making up for lost time with good food and many more of life's adventures.

A very special thank you to my family, in particular my father who inspired me to learn, and to my sisters who cooked for me, made me laugh, and who continued to encourage me in persevering with the challenge of this task .

My husband and best friend Anthony for his unconditional support and encouragement despite working on his own PhD for the majority of this process, and without whom I am sure I would have not made it to the end.

Finally, the individuals who participated in my research for their willingness to share their personal experiences. I hope the results of the research may benefit others from the knowledge gained.

ABSTRACT

Past literature indicates that anxiety symptoms and disorders can manifest in older adults for the first time in late life, without a prior history of psychopathology, and that the experience of anxiety symptoms may vary amongst older adults according to the age at onset of anxiety. Research has yet to comprehensively address this issue. Accordingly, this thesis examined the implications of an age of onset distinction for the presentation and treatment of late-life generalised anxiety disorder (GAD).

This thesis consists of three sections. The first section contains an overview of the thesis and three theoretical chapters which provided the basis for the empirical investigations set out in Sections Two and Three. The main aim of Study One, presented in Section Two of this thesis, was to provide empirical evidence of a bimodal distribution of age at onset of GAD and a method for determining an appropriate cut-off to distinguish these two subgroups. The subsequent investigations presented in Section Two aimed to investigate differences in the aetiology and phenomenology of early-onset (EO) and late-onset (LO) GAD. In addition, the relationship between the experience of negative life events and age at onset of GAD was examined.

Participants included 76 older adults aged 55-84 years meeting diagnostic criteria for a current DSM-IV anxiety disorder, of which GAD was the most commonly diagnosed (96%). Information regarding the onset of current and past episode of psychiatric illness, the demographic and health characteristics of participants, and the experience of negative life events across the lifespan was assessed. As age at onset of GAD defined the groups to be compared, belonging to the EO vs. LO group represented the between subjects independent variable. The results confirmed a bimodal distribution for first lifetime onset of GAD. An age of 34.4 years was identified as the cut-off point to distinguish between participants classified as having EO (n= 24) or LO (n = 56) GAD. EO participants reported significantly greater benzodiazepine and health supplement use; a longer history of anxiety since initial onset; a greater number of episodes of psychiatric illness; a greater family history of psychiatric illness; greater severity of the symptom 'restlessness and/or feeling keyed up;' a greater percentage of time spent worrying; greater distress, and; greater interviewer- rated severity of GAD than LO participants. On the other hand, LO

participants reported greater functional limitations, poorer perceptions of health, and greater frequency and severity of both health-related events and difficult financial circumstances preceding first onset of GAD, than those with EO GAD. The results also showed that LO GAD was associated with the experience and accumulation of greater levels of life stress than EO GAD.

The study presented in Section Three aimed to investigate the relationship between age at onset and the treatment of late-life GAD. Forty-one treatment-seeking participants (EO = 18 and LO = 23) from Study One completed a 12-week CBT program for GAD. Measures of anxiety, worry and depression were completed at five time-points: at pre-treatment (T0), following completion of relaxation training (T1), cognitive skills (T2) and behavioural skills (T3) modules of therapy, and six months following treatment completion (T4). Participant-rated evaluations of symptom severity and treatment efficacy were completed from T1 through to T4. Measures of trait anxiety, anxiety sensitivity, self-efficacy and perceptions of anxiety control were assessed at T0 and at T4. The results showed that treatment resulted in significant improvements on all outcome measures from pre- to post-treatment and that these gains made from treatment were maintained at six-month follow-up. Age of onset was not found to have a significant effect on treatment outcomes. With exception of the finding that LO participants reported significantly greater symptom severity following completion of the relaxation skills module than EO participants, onset groups did not differ in patterns of change over the course of treatment.

Theoretically, the study emphasises the need to accurately conceptualise age of onset and to determine an empirically derived cut-off for distinguishing between early- and late- onset subsamples. Clinically, the study highlights the fact that participants with EO and LO GAD both respond equally well to a manualised CBT program for GAD and that age of onset is not a factor in treatment outcome. The theoretical and clinical implications of the results and the need for further development and refinement of the understanding of an onset distinction in the presentation and management of late-life GAD through future research are discussed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACE	The Addenbrooke's Cognitive Examination
ACQ	Anxiety Control Questionnaire
ADL	Activities of daily living
AIHW	Australian Institute of Health and Welfare
ADIS-IV	Anxiety and Depression Interview Schedule
ADIS-IV-L	Anxiety and Depression Interview Schedule – Lifetime Version
APA	American Psychological Association
ASI	Anxiety Sensitivity Inventory
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
CBT	Cognitive Behavioural Therapy
CDW	Crime, Disaster and War
CIDI	Composite International Diagnostic Interview
CCHS	Canadian Community Health Survey
DD	Dysthymic Disorder
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders – 3rd Edition - Revised
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders – 4th Edition- Text Revision
ECA	Epidemiologic Catchment Area
EO	Early-Onset
GAD	Generalised Anxiety Disorder

GAF	Global Assessment of Functioning Scale
GAI	Geriatric Anxiety Inventory
GDS-15	Geriatric Depression Scale – 15 item version
GMS	Geriatric Mental Schedule
GSE	General Self Efficacy
HAM-A	Hamilton Anxiety Rating Scale
ICD	International Classification of Diseases
HDRS	Hamilton Depression Rating Scale
LASA	Longitudinal Aging Study of Amsterdam
LO	Late-Onset
MDD	Major Depressive Disorder
MMSE	Mini Mental State Examination
MVP	Mitral Valve Prolapse
NCS	National Comorbidity Study
NHS	National Health Survey
OCD	Obsessive-Compulsive Disorder
PC	Perceived Control
PD	Panic disorder
PDF	Probability Density Function
PMR	Progressive Muscle Relaxation
PSWQ	Penn State Worry Questionnaire
PTSD	Posttraumatic Stress Disorder
SCRAS	Sheehan Clinician Rated Anxiety Scale
SES	Self Efficacy Scale

SPSS	Statistical Package for the Social Sciences
SRRS	Social Readjustment Rating Scale
SSE	Social Self Efficacy
STAI	State-Trait Anxiety Inventory
WMH	World Mental Health
WWII	World War Two

SECTION I: GENERAL INTRODUCTION AND LITERATURE REVIEW

CHAPTER ONE

General Introduction and Overview

Age at onset is considered an important index for syndrome distinction in aetiological studies of a number of psychiatric disorders of late-life (Iketani et al., 2004). Primarily, such research has focused on major depressive disorder (MDD) (Benazzi, 2001; Brodaty et al., 2001; Holroyd & Duryee, 1997; Kovacs, Gastonis, Paulauskas, & Richards, 1989; Krishnan, Hays, Tupler, George, & Blazer, 1995; Van den Berg et al., 2001), dysthymic disorder (DD) (Barzega, Maina, Venturello, & Bogetto, 2001; Devanand et al., 2004) and schizophrenia (Howard, Rabins, Seeman, Jeste, & Group., 2000; Palmer, McClure, & Jeste, 2001; Sato, Bottlender, Schroter, & Moller, 2004). In the depression literature in particular, age of onset is considered an important dimension in classifying mood disorders (Klein et al., 1999). Specifically, early-onset (EO) and late-onset (LO) depression have been found to have a different aetiology (Brodaty, et al., 2001; Van den Berg, et al., 2001), clinical presentation, treatment response and outcome (Benazzi, 2001; McMahon et al., 1994), suggesting that LO depression is often a different illness from EO depression.

In recent years, interest has also grown in the relationship between age of onset and the clinical characteristics of late-life anxiety disorders such as panic disorder (PD), agoraphobia, and generalised anxiety disorder (GAD). GAD is of particular interest in light of prevalence data suggesting that it may be the most common anxiety disorder in old age (Bryant, Jackson, & Ames, 2008; Lenze & Wetherell, 2011). Given the important clinical implications of an onset distinction in the depression literature and the links between anxiety and depression in older adults (Bryant, et al., 2008; Manela, Katona, & Livingston, 1996; Sable & Jeste, 2001), this interest is clearly warranted as differences between early- and late-onset of anxiety may have significance for the aetiology or clinical presentation of late-life anxiety disorder. Nevertheless, current knowledge of the relationship between age at onset and late-life anxiety is limited. A review of the existing empirical literature highlights an ad-hoc approach to research to date, often with little theoretical justification of inquiry. The purpose of this thesis is to provide a critical review and synthesis of the existing literature, both empirical and theoretical, before embarking on an empirical

investigation of the relationship between age at onset of late-life GAD and aetiological factors, phenomenology, and treatment response. A greater knowledge of these relationships may assist in both the identification of those at risk of developing GAD in later life, and the treatment and management of those with GAD in late-life. This introductory chapter serves to provide a general overview of the research contained in this thesis, including a synopsis of how the thesis will be structured to address the following research questions:

Research Question 1: Is there an empirically identifiable cut-off age that differentiates EO GAD from LO GAD?

Research Question 2: What are the aetiological differences between older adults with early- and late-onset GAD?

Research Question 3: What are the phenomenological differences between older adults with early- and late-onset GAD?

Research Question 4: What are the differences between older adults with early- and late-onset GAD in the frequency and severity of stressful negative life events preceding the onset of anxiety?

Research Question 5: What is the relationship between the experience of negative life events across the lifespan and symptoms of psychopathology in older adults with GAD?

Research Question 6: What are the implications of an age at onset distinction for the treatment of late-life GAD?

In order to address each of these six research questions it is important to first understand the nature and consequences of anxiety. Chapter Two begins this task by defining the experience of anxiety. A brief description of the specific anxiety disorders referred to in this thesis is then provided. GAD is specifically defined as an anxiety disorder which commonly occurs in late-life, and is highly prevalent in the sample of older adults investigated in this thesis. In order to understand the burden that anxiety in older persons presents for the healthcare system and the community, it then summarises the current and

projected rates of anxiety in older adults in Australia. This is followed by a review of the epidemiologic evidence outlining prevalence rates of anxiety disorders in geriatric populations, highlighting issues of comorbidity and the distinction between anxiety and depression. Finally, an overview of the social, biological and psychological risk factors associated with the onset and maintenance of anxiety in late-life is provided.

Chapter Three reviews and summarises the findings of existing empirical literature relating to the clinical presentation of early- and late-onset anxiety. Late-life anxiety disorders considered in this chapter include PD, agoraphobia and GAD. This chapter then provides a critique of the methodological approaches of past research and discusses the consequent difficulties in drawing firm conclusions or generalising results due to the paucity of theoretically driven research. Chapter Four turns to the examination of a theoretical model that has been proposed to account for the age at onset distinction in late-life depression. Given that anxiety and depression are closely related disorders in late-life, Boyd, McKiernan and Waller's (2000) cognitive model of early- and late-onset depression is considered as a model which may potentially be applied to distinguish the content and process of early- and late-onset anxiety. The relative strengths of this model are discussed with reference to supporting empirical evidence.

Chapter Five outlines the aims and research questions to be addressed by the empirical investigations included in Section Two of this thesis, and the theoretical implications of these investigations. By referring to the literature review presented in earlier chapters, the first five research questions are outlined in greater depth. A number of specific and more detailed hypotheses and/or exploratory research questions are put forward for the purposes of comprehensively addressing each of these five primary research questions. The general methods for the empirical investigations, presented in Section Two, are set out in Chapter Six.

The broad aims of the empirical sections of this thesis then are to use the theoretical framework outlined in Chapter Four to address the six research questions outlined above. The first empirical study, as set out in Chapter Seven, was designed to determine whether there is evidence for the existence of two sub-populations of anxious older adults. Having established the existence of an early- and late-onset anxiety group, a secondary aim of the study was to determine a cut-off point for best deciding to which sub-population a given age of onset belongs (Research Question 1). The meaning of the results in terms of empirical evidence of a bimodal distribution of onset of anxiety disorders is discussed.

The studies presented in subsequent chapters of Section Two were designed to explore differences in the aetiology, phenomenology, and the experience of negative life events between of subgroups of anxious older adults. These adults were classified as having early- or late-onset GAD according to the cut-off age identified in the previous chapter. Specifically, the study presented in Chapter Eight aimed to investigate differences between sub-groups of older adults with EO and LO GAD across various demographic and clinical variables identified as risk factors for anxiety in older persons (Research Question 2). Chapter Nine examines and presents the findings of a study investigating potential differences in the phenomenology of early- and late-onset GAD (Research Question 3). Chapter Ten aimed to examine Research Question 4 by testing the model put forth by Boyd et al. (2000). Chapter Ten also examines Research Question 5 by conducting an exploratory study investigating the relationship between the experience of negative life events across the lifespan and symptoms of anxiety and depression amongst older adults with early- and late-onset of GAD.

Chapter Eleven, as set out in Section Three of this thesis, examines and presents the findings of a study designed to investigate the implications of an age at onset distinction for the treatment of GAD in late-life (Research question 6). Finally, Chapter Twelve summarises the results of the present empirical investigations with reference to the theoretical framework, discusses their implications, limitations and directions for future research. Greater understanding of the impact of age at onset of anxiety in late-life has important clinical implications, particularly for the treatment and management of anxiety in older adults.

CHAPTER TWO

An Introduction to Anxiety in Late-life: Definitions, Prevalence, Comorbidity and Risk Factors

2.1 Definition of Anxiety

Anxiety is an adaptive emotional reaction that helps prepare young and old for coping through resource mobilisation or avoidance, with an anticipated or ongoing event that is perceived as noxious or threatening (Sheikh, 2003). Such anxiety becomes pathologic when it becomes excessive or maladaptive, and can significantly interfere with an individual's ability to hold and fulfil multiple roles (e.g. occupational, family, and social) (Lauderdale & Sheikh, 2003). Clinically significant anxiety is manifested by a variety of symptoms including (i) cognitive symptoms (nervousness, worry, apprehension, fearfulness, irritability); (ii) behavioural symptoms (hyperkinesis, pressured speech, exaggerated startle response); and (iii) physical symptoms (muscle tension, chest tightness, palpitations, hyperventilation, paresthesias, and sweating) (American Psychiatric Association, 1994).

The major physical symptoms of anxiety in older age groups include muscle tension, headaches, pressure in the chest, difficulty swallowing, heart palpitations, and gastrointestinal discomfort (Ayers, 2005). These physical symptoms of anxiety are reported at a higher rate among older adults than younger age groups. In addition, it has been found that older adults who are anxious tend to physically and behaviourally exhibit increased agitation and aggressiveness in addition to the typical anxiety symptoms (Leger et al., 2000). Furthermore, sleep disturbance has been found to be one of the major distinguishing symptoms in older anxious people (Wetherell, Le Roux, & Gatz, 2003).

Specific anxiety disorders defined in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000) include; *Panic Disorder (PD)*, which is characterised by recurrent or persistent panic attacks. A panic attack is a discrete period in which there is a sudden onset of intense apprehension, fearfulness, or terror, often

associated with feelings of doom. During such attacks, symptoms such as shortness of breath, chest pain or discomfort, choking or smothering sensations can be present. *Agoraphobia* is defined as anxiety about, or avoidance of places or situations from which escape might be difficult, or in which help may not be available in the event of a panic attack or panic like symptom. Panic disorder may occur with or without agoraphobia, and agoraphobia without a history of panic disorder may also occur.

A *Specific Phobia* is characterised by clinically significant anxiety provoked by exposure to a specific feared object or situation which often leads to avoidance behaviour. *Social Phobia,* on the other hand, is defined by clinically significant anxiety resulting from exposure to certain types of social or performance situations, which similarly leads to avoidance of such situations. *Obsessive-Compulsive Disorder (OCD)* describes a range of obsessions which can cause significant anxiety or distress, or by compulsions, which serve to neutralise anxiety. *Posttraumatic Stress Disorder (PTSD)* involves the re-experiencing of an extremely traumatic event accompanied by symptoms of increased arousal/hypervigilance and avoidance of stimuli associated with the trauma. *Generalised Anxiety Disorder (GAD)* is characterised by excessive and uncontrolled worry of at least six months duration (American Psychiatric Association, 2000). This worry or apprehensive expectation is accompanied by at least three or more somatic or psychological symptoms. These include restlessness, fatigue, muscle tension, irritability, difficulty concentrating, and sleep disturbance (American Psychiatric Association, 2000), and there are often marked impairments in daily functioning (Wittchen, Zhao, Kessler, & Eaton, 1994). At present, GAD is poorly recognised and consequently often undertreated (Keller, 2002).

2.2 Population Ageing in Australia and its Impact on the Incidence of Anxiety

2.2.1 Population estimates and projections of an ageing population

According to the Australian Institute of Health and Welfare (AIHW) the number of Australians aged 65 years and older is expected to increase from 2.7 million in 2006 to 6.3 million in 2036, representing 24% of the total population at that time (AIHW, 2007). Moreover, the number of older Australians aged 85 years and over requiring the need for services and assistance has doubled over the past 20 years. This age group is projected to

increase more rapidly than other age groups from 330 000 in 2006 to 1.1 million in 2036, that is, from 1.6% of the total population to 4.2% (AIHW, 2007). People aged 85 and older are also projected to increase their share of the total older population from 12% of older Australians in 2006 to 18% in 2036 (AIHW, 2007).

2.2.2 Anxiety incidence and age

In addition to the increase in the aged population, the projected figure of psychiatric disorders amongst older adults is estimated as being at least 20% by 2036 (Koder & Ferguson, 1998). Results of the 2004-05 Australian National Health Survey (NHS) of mental health (Australian Bureau of Statistics, 2006) revealed that although the majority of older people enjoyed good mental health, a significant number of older people (9.5%, or approximately 230 800 people) experienced one or more mental or behavioural disorder. The most commonly reported mental health problems were mood and anxiety related problems (4.6% and 4.2% respectively). Additionally, 10.9% of older adults reported high levels of psychological distress, and 24% take medication for their psychological or mental well-being (AIHW, 2007).

Research published by the Australian Bureau of Statistics (McLennan, 1998) also report anxiety to be the most common mental disorder among older adults, despite being the most under-diagnosed and under-treated. The incidence of anxiety disorders in older adults may be underestimated due to the finding that older people are twice as likely to decline involvement in some surveys and studies (Snowdon, 2001) . Thus, although the proportion of adults aged 65 and older experiencing anxiety symptoms appears to decline in comparison to younger and middle-aged groups, these rates are nonetheless significant when considering Australia's ageing population and projected figures for our ageing population in years to come. The following section reviews the epidemiologic evidence outlining prevalence rates of anxiety disorders in geriatric populations in both community and clinical settings. This further highlights the impact and importance of investigating the experience of anxiety symptoms and disorders in later life.

2.3 Prevalence of Anxiety Disorders in Older Adults

Until recent years, there has been considerable consensus in the research literature that most anxiety disorders begin before young adulthood (Barlow, 1988), and that anxiety disorders rarely have onset in late-life (Burke, Burke, Regier, & Rae, 1990; Lindesay, 1991a). This has led to the belief that most cases of anxiety disorders among older adults involve individuals who have experienced problems with anxiety for many years (Flint, 1994, 1997; Stanley & Beck, 2000) and epidemiologic studies have generally reported that their prevalence declines in later life (Bland, Newman, & Orn, 1988; Regier et al., 1988). Based on the conclusions of these early epidemiological studies, anxiety disorders are reported to be less common in community-living older adults compared with younger adults. Despite such beliefs, the occurrence of anxiety symptoms without a prior history has been noted to occur in later life and epidemiologic studies that have had a strong focus in geriatric populations (Beekman, Bremmer, Deeg, van Balkom, & Smit, 1998; Flint, 1994; Lindesay, Briggs, & Murphy, 1989; Manela, et al., 1996) indicate that anxiety disorders are quite prevalent amongst older persons. Rates of all anxiety disorders in later life are reported to range from 5.5% (Regier, et al., 1988) to 15% (Beekman, et al., 1998; de Beurs, Beekman, Deeg, van Dyck, & van Tilburg, 2000; de Beurs et al., 1999; Manela, et al., 1996) depending on the characteristics of the populations sampled (i.e., community-dwelling versus institutionalised), the diagnostic criteria employed, and the method of eliciting symptoms (Sable & Jeste, 2001).

The Epidemiologic Catchment Area (ECA) survey, which evaluated lifetime and current prevalence of psychiatric disorders in the community, documented a one-month prevalence rate of 5.5% for all of the anxiety disorders in individuals aged 65 and older (Regier, et al., 1988; Regier et al., 1984). This was lower than the rate of 8.3% found for those aged between 25-44 years of age, the age at which anxiety is considered at its peak prevalence. Whilst some have taken the above findings to indicate that anxiety disorders may not represent a significant mental health problem in later-life, anxiety disorders were in fact found to be more than twice as prevalent as affective disorders, and four to seven times as prevalent as major depression in the ECA study (Regier, et al., 1988). Furthermore, the prevalence of anxiety disorders amongst older adults in the ECA study is thought to have

been underestimated due to its inclusion of community dwelling residents only, and there is some suggestion that anxiety disorders appear to be more prevalent among institutionalised older adults (Bland, et al., 1988). Prevalence rates of anxiety symptoms in geriatric settings are reported to range from 19% of nursing home residents (Ouslander, Osterweil, & Morley, 1991; Parmelee, Katz, & Lawton, 1993) to as high as 44% (Kvaal, Macijauskiene, Engedal, & Laake, 2001). The findings suggest that the prevalence of anxiety, however variably defined, is much higher in clinical samples than in community samples.

Prevalence rates of anxiety can further vary when looking at individual anxiety disorders. Phobic disorders (i.e., agoraphobia, simple phobia and social phobia) have been reported to be the most common anxiety disorders in people of all ages, including older age groups in some studies (Bland, et al., 1988; Regier, et al., 1988). Prevalence rates of phobic disorders across various studies range from 1.4% to 25.6% using the Geriatric Mental State (GMS-AGECAT: Copeland, Dewey, et al., 1987; Copeland, Gurland, et al., 1987), DSM III criteria and the Phobic Disorders Screen (Lindesay & Banerjee, 1993). This variability is likely to reflect differences in both the instruments used, and application of hierarchical diagnostic rules. Of the phobias, social phobia appears to have a relatively low prevalence, with some authors suggesting the reason being that it is easier for older people to avoid social situations (Bryant, et al., 2008). With regard to prevalence of specific anxiety disorders, some studies reporting phobic disorder to be the most common anxiety disorder in older adults (Bland, et al., 1988; Regier, et al., 1988) did not include GAD in their surveys, even though GAD has been found to be more prevalent than phobic disorder in other studies (Beekman, et al., 1998).

When GAD is included as a diagnostic entity in prevalence studies, it is often found to be the most common anxiety disorder in older persons (Bryant, et al., 2008), with prevalence rates much higher than the 4.6% found in the ECA study. Lower prevalence rates reported for GAD are in part due to the utilisation of the hierarchical diagnostic system of DSM-III-R (American Psychiatric Association, 1987), which precludes a diagnosis of GAD if an individual has comorbid depression or other anxiety disorders. In Australia, the twelve - month prevalence rates of non-hierarchical GAD in adults aged $\geq$ 65 years was reported to be 1.6% in a study of mental health and well being (Hunt, Issakidis, & Andrews, 2002)

compared with a peak prevalence rate of 4.9% in younger adults. Flint (1999) has reported prevalence rates of GAD to range from 0.7% to 7.1%. In contrast to findings of studies using DSM-III-R hierarchical criteria for GAD, a review of the major community-based epidemiological studies reporting data on anxiety disorders in individuals 65 and over by Krasucki and colleagues (1998) found the prevalence of GAD to be around 4%. According to the Longitudinal Aging Study Amsterdam (LASA: Beekman, et al., 1998) the rate of GAD in later life (7.3%) was more than three times the rate of major depression (2%). Panic disorder (PD) and obsessive-compulsive disorder (OCD) are less common in older persons, each with an estimated prevalence of 1% or less (Beekman, et al., 1998; Carmin, Wiegartz, & Scher, 2000; Regier, et al., 1988). Given the above findings, GAD appears to be the most common anxiety disorder in older adults (Blazer, George, & Hughes, 1991; Burke, et al., 1990).

2.3.1 Summary

Although it is generally believed that anxiety disorders in older adults are less common than depression, epidemiological studies reveal that this is not the case (Beekman et al., 2000), and despite reports of a decline in prevalence of anxiety disorders among individuals aged 65 and over, they nevertheless occur at significant rates (Lynch, Compton, Mendelson, Robins, & Krishnan, 2000). About one fifth of older adults are estimated to experience clinically significant symptoms of anxiety at any given time (Hocking & Koenig, 1995; Manela, et al., 1996; Sheikh & Salzman, 1995), while 34% are estimated to have had anxiety symptoms at some point in their lives (Blazer, Hughes, & George, 1991). In addition, anxiety disorders are estimated to occur more than twice as often as affective disorders and are four to eight times more frequent than MDD in individuals aged 65 and over (Regier, et al., 1988; Weissman et al., 1985). As such, anxiety disorders are among the most common psychiatric illness to affect adults in late-life. Further, on examination of prevalence rates of specific anxiety disorders, findings of epidemiologic studies focusing on geriatric populations and those studies that do not use the DSM-III hierarchical system for assigning diagnoses indicate that GAD appears to be the most common anxiety disorder affecting older adults. The prevalence rates, combined with the pervasive and chronic

nature of anxiety suggest that there is a need for research on the experience of anxiety, in particular GAD, in late life.

2.4 Impact of Anxiety on the Individual and the Community

In light of the incidence and prevalence rates outlined in the foregoing sections it is apparent that anxiety symptoms can cause considerable suffering to the individual. In older adults anxiety is reported to cause considerable subjective distress and impairment (Ayers, Sorrell, Thorp, & Wetherell, 2007; Lynch, et al., 2000), reduced life satisfaction (Brenes et al., 2005), and increased risk for the onset of disability, even in high-functioning older adults (Seeman et al., 1995). In addition, GAD is associated with role impairments such as being divorced or separated and higher rates of unemployment. It is also associated with self-reported interference with daily activities (Wittchen, et al., 1994), more visits to primary care providers (Blazer, George, et al., 1991; Kennedy & Schwab, 1997; Wetherell, Maser, & van Balkom, 2005), and increased average length of visit (de Beurs, van Balkom, Van Dyck, & Lange, 1999). Anxiety symptoms and disorders also increase the risk of mortality as a result of both physical conditions such as cardiovascular disease (Sadavoy & LeClair, 1997; Van Hout et al., 2004), and suicide (Allgulander & Lavoria, 1993). Sub-threshold symptoms as well as full-blown disorders cause impairment in the psychosocial functioning of older adults in later life.

Because of the adverse consequences of anxiety disorders in older adults in terms of both human suffering and excessive or inappropriate health service use, the treatment of geriatric anxiety, specifically of GAD, is an important issue (Wetherell, Sorrell, Thorp, & Patterson, 2005). One follow-up study of older adults with untreated anxiety symptoms suggests that anxiety in this population generally does not remit spontaneously over the course of two to three years (Livingston, Watkin, Milne, Manela, & Katona, 1997). Further, the majority of older adults who receive treatment for anxiety symptoms are prescribed with medications. Epidemiological data suggest that the rate of benzodiazepine use among older persons is 14% higher than rates for younger adults, and anxiety-related disorders have been noted to constitute the most frequent use for these drugs in both younger and older patients (Schneider, 1996).

Benzodiazepine users have been found to be more likely than non-users to experience accidents requiring medical attention (Oster, Russell, Huse, Adams, & Imbimbo, 1987), and the use of long half-life benzodiazepines such as diazepam (valium) have been associated with increased risk of hip fracture (Ray, Griffin, & Downey, 1989). In addition to sedation, the toxic effects of benzodiazepines in older adults include unsteadiness, falls, confusion and impairment in memory and other cognitive functions, even at low doses (Schneider, 1996; Wengel, Burke, Ranno, & Roccaforte, 1993). Schneider notes that despite their disadvantages and limitations in safe use for older patients, benzodiazepines remain the treatments of choice for acute or subacute anxiety symptoms amongst medical practitioners.

2.5 Comorbidity of Anxiety and Depression

Comorbidity is an important issue in the consideration of anxiety disorders in both the research literature and in clinical practice with older adults. According to Bryant et al., (2008), the neglect of anxiety in its own right may be a consequence of the view that anxiety disorders rarely occur in the absence of depressive symptoms. Indeed, empirical evidence points to frequent co-occurrence of anxiety and depression, with literature reporting rates ranging from 30-70% in various populations of mixed age and older adults, including community dwelling, those in clinical settings (Alexopoulos, 1991; Blazer, Hughes, & George, 1987; Regier, Narrow, & Rae, 1990), and amongst institutionalised older adults (Parmelee, et al., 1993). Given that anxiety disorders and depression are closely related in late-life, models put forth in the depression literature may therefore have some explanatory value for understanding late-life anxiety. As such, an understanding of the relationship between anxiety and depression in late-life is necessary. The following sections provide an overview of this relationship with respect to specific anxiety disorders, and of the temporal sequencing in the onset of comorbid anxiety and depression.

Assessment of anxiety and depression at the syndromal or diagnostic level of caseness has shown the two to be highly correlated, even when categorical definitions and strict operational criteria are used (Angst, 1996; Kessler et al., 1994). Furthermore, studies of

older adults suggest that both disorders often share common risk factors, and since some symptoms are common to both of these disorders (e.g. irritability, sleep and appetite disturbance, difficulty concentrating, poor memory), it may be difficult to distinguish between anxiety and depression. Further barriers to teasing out this relationship include the use of hierarchical case definition, whereby participants of studies using this criterion who are cases of depression are not deemed cases of anxiety. Under-reporting of anxiety symptoms to a greater extent than depression by older people, as well as under-recognition of symptoms by medical practitioners further add to this difficulty (Bryant, et al., 2008). In any case, it is clear that the prevalence of anxiety disorders in people with depression and vice versa is much higher than would be expected by chance. Lenze et al. (2001) reported that approximately 85% of adults with depression have significant symptoms of anxiety, while Jeste, Hays and Steffens (2006) found that 42% of their depressed sample endorsed comorbid anxiety symptoms. In another study Maser and Cloninger (1990) reported that about one-third of older adults with an anxiety disorder meet the criteria for depression, and about two-thirds of depressive patients meet the diagnostic criteria for an anxiety disorder.

Anxiety and depressive symptoms frequently coexist to varying degrees within MDD, DD, PD, and GAD (Beekman, et al., 2000; Katon & Roy-Byrne, 1991). A study of the prevalence rates of anxiety and depression in a community-dwelling sample of older adults by Lindesay et al. (1989) found that 39% of phobic participants also had depression, compared to only 11% of participants without phobias. Comorbidity was found to be highest in participants diagnosed with GAD, 91% of whom also had a diagnosis of depression. In another study of anxiety prevalence Manela, et al. (1996) reported a high level of comorbidity between GAD and depression, reporting major depression to occur in up to 70% of older persons with GAD. In a more recent study Lenze et al. (2000) found that almost 28% of patients with major depression aged 60 and over had concurrent GAD. Further, up to 75% of older depressed patients have clinically significant subsyndromal symptoms of generalised anxiety (Copeland, Davidson, & Dewey, 1987).

In comparison with either depression or generalized anxiety, the co-occurrence of depression and generalized anxiety is reported to represent a more severe and more chronic psychopathology (Holwerda et al., 2007). Moreover, remission rates for depression and co-

existing generalized anxiety are lower in comparison with 'pure' depression or 'pure' GAD. Although high levels of comorbidity between depressive disorders and anxiety disorders have been found, anxiety disorders and depressive disorders merit separate study because risk factors reveal more differences than similarities (Beekman, et al., 2000). Furthermore, different neurobiological mechanisms in generalized anxiety and depression indicate a biological distinction between generalized anxiety and depression (Nutt, 2001).

Whilst the literature reviewed above demonstrates the evidence of substantial comorbidity between both anxiety and depressive disorders in people of all ages (Byrne, 2002), there is uncertainty about which disorder is likely to have developed first among older patients. A number of researchers have reported the onset of most anxiety disorders to precede that of MDD (Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Mineka, Watson, & Clark, 1998; Sanderson, Beck, & Beck, 1990; Schneier, Johnson, Hornig, Liebowwitz, & Weissman, 1992; Schoevers, Beekman, Deeg, Jonker, & Van Tilburg, 2003b; Schoevers, Deeg, van Tilburg, & Beekman, 2005; Stein, Tancer, Gelernter, Vittone, & Uhde, 1990; Wittchen, Carter, Pfister, Montgomery, & Kessler, 2000). In addition, the risk of depression in individuals with chronic anxiety disorders such as GAD is reported to be greater than the risk of anxiety in individuals with depressive disorders (Angst, 1996). Findings of the National Comorbidity Study (NCS: Kessler et al., 1996) and a second population based study by Hettema, Kuhn, Prescott and Kendler (2006) indicate that prior existence of any anxiety disorder significantly increases the risk for subsequent development of MDD, with the strongest risk attributable to previous GAD. Of note was the finding of the NCS study that approximately 68% of participants reported the onset of MDD to have followed the onset of an anxiety disorder. This figure exceeded rates of substance use disorders (19.2%) and dysthymia (1.8%). Analyses further indicated that GAD was typically the temporally primary disorder in relation to depression among people with comorbid anxious depression (Kessler, Keller, & Wittchen, 2001; Kessler, et al., 1996). Longitudinal studies investigating the issue of comorbidity between anxiety disorders and depression report similar conclusions to those of a cross-sectional nature (de Beurs et al., 2001; Schoevers, et al., 2005). Longitudinally, although not all individuals with anxiety symptoms or disorders develop depression, studies in all age groups typically find a pattern of progression from anxiety to depression (Schoevers, et al., 2005).

2.5 .1 Summary

Evidence suggests that 38% to 46% of older adults with depression have comorbid anxiety disorders, most notably GAD (Beekman, et al., 2000; Lenze, et al., 2000), whereas 15% to 30% of older adults with anxiety disorders have comorbid depression (Beekman, et al., 2000; van Balkom et al., 2000). Although it is thought by many clinicians that most anxiety disorders in older adults are comorbid with depression, anxiety disorders without comorbid depression are much more common than depression without comorbid anxiety (Beekman, et al., 2000; Le Roux, Gatz, & Wetherell, 2005). With regard to the temporal sequence of onset, findings of two separate investigations have revealed that the most common lifetime pattern of comorbidity was GAD preceding depression (Lenze et al., 2005; Schoevers, et al., 2005).

Although there is considerable overlap between anxiety and depression, the distinctions still appear to be meaningful (Teachman, Siedlecki, & Magee, 2007). Clark and Watson (1991) note that findings of high comorbidity between the two disorders can be reversed to highlight the fact that approximately half of all persons diagnosed with depression do not have an anxiety diagnosis, suggesting that they are distinct disorders, and as such, warrant separate investigation. In order to investigate the presentation and experience of anxiety disorders in old age, it is first necessary to gain an understanding of the risk factors associated with anxiety in later life.

2.6 Risk Factors for Anxiety in Later Life

The research conducted on older adults with anxiety disorders has shown that the clinical experience of these disorders is complex. Fortunately, research in the area has gone some way to delineating the nature of this experience and previous investigations have identified a number of risk factors that may be associated with symptoms and clinically relevant levels of anxiety disorders in older persons. These factors may be broadly categorised as social, biological, and psychological. Findings of these studies suggest that though longstanding vulnerability factors such as family and personal histories of anxiety may have a role in the risk profile of anxiety disorders in older persons, the prevalence of risk

factors such as deteriorating physical health, cognitive decline, and a diminishing social network, combined with medical advances allowing older adults to live longer, may contribute to or account for the increasing prevalence of anxiety disorders in later life. Knowledge of risk factors for anxiety in older persons may help increase the power of detecting this disorder in later life, and may contribute to the development of preventative measures. Risk factors known to contribute to the aetiology of anxiety in older adults will be outlined in the present section with a view to developing an understanding of the presentation of anxiety in late-life and investigating potential differences in the relationship of these risk factors with early-and late-onset of anxiety in subsequent chapters of this thesis.

2.6.1 Social Risk Factors

Demographic characteristics

Data from studies that have examined variables associated with the development of anxiety in late-life (Beekman, et al., 1998; Beekman, et al., 2000; de Beurs, et al., 2000; de Beurs, et al., 2001; Flint, 1997, 2005b; Lenze, Shear, Mulsant, & Reynolds, 2002; Schaub & Linden, 2000) suggest that older women have a much greater chance of experiencing an anxiety disorder than older men. These findings are consistent with those of the ECA survey (Regier, et al., 1988; Weissman, et al., 1985), in which older women were found to be at greater risk of experiencing an anxiety disorder relative to older men, with a reported ratio of 2:1. Specifically, female sex and high neuroticism put one at risk for developing anxiety symptoms, and for remaining anxious as well (de Beurs, et al., 2000).

With regard to other demographic variables considered to be risk factors for anxiety, lower levels of education have been found to be significantly associated with GAD in late-life. (Beekman, et al., 1998; de Beurs, et al., 2000). Differences found for marital status are in favour of married subjects, with separation, widowhood, or being divorced increasing the probability of suffering generalised anxiety (Beekman, et al., 1998; Beekman, et al., 2000; Wittchen, et al., 1994). In line with these findings, Schaub and Linden (2000) found separated, divorced, or single subjects to perceive more anxiety of the phobic and panic

type. This finding was independent of age group, further indicating that being married might exert a protective function against anxiety.

Qualitative aspects of social network: Lack of social support, loneliness and negative life events

Investigations of risk factors based on data from the Longitudinal Aging Study Amsterdam (LASA: Deeg, Knipscheer, & van Tilburg, 1993) have found a small social network and less exchange of emotional support to be significantly associated with phobic disorders, whilst loneliness was found to be significantly associated with GAD. As such, social support has been reported to be a protective factor, with other investigations reporting social support to be associated with a lower likelihood of developing an anxiety disorder when exposed to stressful events (Beekman, et al., 1998; de Beurs, et al., 2001). In another study investigating predictors of change in anxiety symptoms over time, no social functioning risk factors were found to be associated with developing anxiety (de Beurs, et al., 2000).

Regarding the role of negative life events, both recent losses in the family (widowhood) and suffering chronic physical illness have been found to be significantly associated with anxiety disorders (Beekman, et al., 1998; de Beurs, et al., 2000; Vink, Aartsen, & Schoevers, 2008). In particular, PD and OCD have been found to have the strongest associations with partner loss, chronic physical illness, and poor subjective health, whilst experiencing negative events in World War II (WWII) is significantly associated with GAD (Beekman, et al., 1998). Having experienced a traumatic event such as being a victim of crime is associated with phobic disorders among older adults (Lindesay, 1997).

2.6.2 Biological Risk Factors

Chronic disease and vascular factors

Studies investigating the association between chronic disease and vascular factors with anxiety symptoms in late-life have found both cognitive impairment (Forsell & Winblad, 1998) and high blood pressure (Paterniti et al., 1999) to be correlated with anxiety symptoms. With regard to investigation of chronic disease, Beekman et al. (1998) found

chronic diseases to be weakly associated with any anxiety disorder and strongly, but not significantly, associated with PD and OCD. In another study, van Zelst et al. (2003) found the number of chronic health conditions experienced by older adults to be correlated with anxiety disorders in late-life.

Self-perceived health

Poor self-perceived health has been found to be significantly associated with GAD (Beekman, et al., 1998), and has been reported to be a better predictor of decline in mental health than chronic diseases (de Beurs, et al., 2001). De Beurs and colleagues findings are consistent with previous findings of Beekman et al. (1998), that subjective evaluations of physical health were more strongly associated with anxiety disorders than more objective measures of physical health. Accordingly, how respondents experience their own health is reported to predict subsequent emotional functioning more strongly than their objective health status, consistent with findings reported by Bath and Morgan (1998; cited in de Beurs, et al., 2001). In another study investigating predictors of change in anxiety symptoms over time by de Beurs et al., (2000), those with a perception of poor health were also found to be more likely to become or remain anxious. Similarly, chronicity of anxiety symptoms was also associated with decreased subjective health and increased limitations in functioning.

Disability

Using data from the LASA (LASA: Deeg, et al., 1993), Beekman et al. (1998) found that suffering functional limitations, categorised as disability, had the most consistent association with all anxiety disorders, including a significant association with GAD. These findings are consistent with research in which those with greater functional limitations and problems with hearing and/or eyesight were more likely than those not suffering such problems to become or remain anxious (de Beurs, et al., 2000), and with later reports of a correlation between functional limitations and anxiety disorders (Beekman, et al., 2000; Schoevers, et al., 2003b; van Zelst, de Beurs, Beekman, Deeg, & van Dyck, 2003).

Genetic factors

A family history of anxiety is a strong predictor of anxiety disorders (Rapee, 2002). There is a growing consensus in the research literature that some aspects of anxiety run in families and are almost certainly heritable (Barlow, 2002). However, what seems to be inherited is a 'vulnerability' to develop an anxiety disorder, rather than a specific clinical syndrome itself (Malcarne & Hansdottir, 2001). This is consistent with findings that older adults with anxiety disorders have a family history (parents and/or siblings and relatives) with an anxiety disorder (Beekman, et al., 2000; de Beurs, et al., 2000). Several studies have also shown a strong link between anxiety disorders in an individual and their first-degree relatives (Crowe, Noyes, Pauls, & Slymen, 1983; Noyes, Clarkson, Crowe, Yates, & McChesney, 1987; Rapee, 2002). Other research focused specifically on parents has shown that anxious children and their parents are likely to be concordant for anxiety disorders (Beidel & Turner, 1997).

2.6.3 Psychological Risk Factors

In a study of which risk factors are most important for anxiety disorders amongst older persons, Beekman et al. (1998) investigated a range of personality factors and found an external locus of control to be significantly associated with GAD (Beekman, et al., 1998; Beekman, et al., 2000). In another study, again using data from the LASA study (LASA: Deeg, et al., 1993), de Beurs et al. (2000) found high neuroticism, low self-efficacy and low mastery all to be predictors of becoming anxious in later life. Overall, personality traits such as external locus of control (Beekman, et al., 2000) and neuroticism (van Zelst, et al., 2003), dysfunctional coping (Coolidge, Segal, Hook, & Stewart, 2000) and psychopathology (de Beurs, et al., 2001; Forsell, 2000; Schoevers, et al., 2003b; Schoevers, et al., 2005) are all found to be cross-sectionally and longitudinally associated with anxiety symptoms and disorders.

2.6.4 Summary

The reviewed studies reveal that longitudinally, female gender, low education, being single as well as personality traits, inadequate coping strategies, previous psychopathology and

qualitative aspects of one's social network are all risk factors associated with the incidence of anxiety disorders in older adults (Beekman, et al., 1998; Beekman, et al., 2000; de Beurs, et al., 2000; de Beurs, et al., 2001; Forsell, 2000; Schoevers, et al., 2005; van Zelst, et al., 2003; Vink, et al., 2008). Anxiety complaints in late-life are closely linked with poor physical health and depression (Stanley & Beck, 2000), with generalised anxiety or panic symptoms being the usual presentations among these patients (Astrom, 1996; Sembi, Tarrier, O'Neill, Burns, & Farragher, 1998). Chronic diseases and functional limitations showed only cross-sectional associations with anxiety disorders; however, findings from cross-sectional and longitudinal studies were found to be similar. Of the stress-related factors associated with developing an anxiety disorder in late-life, poor self-perceived health is associated with the development of anxiety in older adults, as are functional limitations (i.e. limited ability to perform day to day activities) (Le Roux, et al., 2005), and distress due to negative life events (traumatic early experiences and recent losses) (Beekman, et al., 1998; Iketani, et al., 2004). Moreover, personality traits including high neuroticism, low self-efficacy, low mastery, and external locus of control are all associated with anxiety symptoms and disorders in older adults.

2.7 Conclusions

Anxiety symptoms and disorders are a significant mental health concern facing older adults in Australia and abroad, and will continue to be so in the coming years. Despite reports of a decline in the prevalence of anxiety disorders in later life, epidemiological evidence suggests that anxiety disorders, in particular GAD, are in fact highly prevalent in older adults (Beekman, et al., 1998; Manela, et al., 1996; Regier, et al., 1984). Furtheremore, the pervasive and chronic nature of anxiety poses a major problem in later life (Beekman, et al., 1998; de Beurs, et al., 2000; de Beurs, et al., 2001; Deeg, et al., 1993). Evidence supporting a distinction between anxiety disorders and depression in later life and highlighting the negative consequences of this comorbidity in adult populations further indicate that the presentation and treatment of anxiety disorders in older adults warrants investigation in and of itself.

With regards to risk factors for anxiety in late-life, both cross-sectional (Forsell & Winblad, 1998; Paterniti, et al., 1999; Stevens & Andersson, 1996) and longitudinal studies (Beekman, et al., 1998; Beekman, et al., 2000; de Beurs, et al., 2000; de Beurs, et al., 2001; Forsell, 2000; Schoevers, et al., 2005; van Zelst, et al., 2003) have identified a number of risk factors associated with symptoms and clinically relevant levels of anxiety disorders in older persons. These include female gender, less education, functional limitations, fair or poor subjective health, external locus of control, low self-efficacy, neuroticism, traumatic early life experiences, and recent losses (Beekman, et al., 1998; Beekman, et al., 2000; de Beurs, Beekman, et al., 1999). These findings are not however specific to an onset distinction. Accordingly, knowledge regarding the relationship between these biological, psychological and social risk factors and age of onset is as yet unknown. It will be seen in coming chapters that some of these risk factors are likely to be long-standing and therefore more relevant to an early age of onset, for example personality traits, early trauma experiences (e.g. experiencing WWII) and genetic factors. Others are events or circumstances which are particularly likely to occur in later life and with increasing frequency. These include bereavement, declining physical health and strength, loss of cognitive capacity and increasingly restricted social network. In itself, this is an argument for investigating whether there is a qualitatively different late-onset subtype of anxiety disorders.

CHAPTER THREE

Empirical Evidence of a Distinction in the Aetiology and Clinical Experience of Early- and Late-onset Anxiety

Whilst knowledge regarding the importance and implications of age at onset for anxiety disorders is limited, there is some empirical support for a distinction in the aetiology and phenomenology of early- and late-onset anxiety disorders. Amongst the anxiety literature, preliminary evidence of these differences exists for panic disorder (PD), and to a lesser degree, PD with agoraphobia. More recently, generalised anxiety disorder (GAD), previously highlighted as a disorder commonly known to occur in later life, has been a focus of interest regarding an onset distinction. The present chapter reviews this literature with a view to outlining our current understanding of the relationship between age of onset and the experience of these anxiety disorders in late-life. Firstly, it provides a definition of 'late-onset' as defined in the depression literature, in which onset research was first established. A review of the empirical evidence of an onset distinction in the aetiology and phenomenology of anxiety disorders including panic disorder, agoraphobia and GAD follows. Finally, this chapter discusses limitations in the current literature with regard to definitions of 'age of onset' and highlights the gaps in our current knowledge regarding an onset distinction in late-life anxiety disorders.

3.1 Definition of 'Late-onset'

In the depression literature, there is no standard age for 'early onset' (EO) depression (Benazzi, 2001), and according to Devanand et al. (2004), a consensus on an age cut-off for defining late onset (LO) depression does not exist. As such, LO depression has typically been defined as that which starts at an advanced age (Van den Berg, et al., 2001). Based on this definition, cut-off points for LO depression have ranged from 50 to 65 years in the research literature (Baldwin & Tomenson, 1995; Krishnan, et al., 1995; Reynolds et al., 1998; Van den Berg, et al., 2001). Consequently, an onset prior to this age range has been variably defined as 'early-onset', depending on the study and the cut-off selected to represent the LO group. For research purposes this method of defining EO and LO has

carried through to preliminary investigations of age at onset and late-life anxiety, as reflected in the literature reviewed in the following sections.

3.2. Empirical Support for an Onset Distinction in the Aetiology of Panic Disorder (PD) in Late-life

PD in both younger and older adults has primarily been the focus of onset research amongst anxiety disorders (Barzega, et al., 2001; Goldstein, Wickramaratne, Horwarth, & Weissman, 1997; Hassan & Pollard, 1994; Iketani, et al., 2004; Raj, Corvea, & Dagon, 1993; Sheikh, King, & Taylor, 1991; Sheikh, Swales, Carlson, & Lindley, 2004; Venturello, Barzega, Maina, & Bogetto, 2002). Studies amongst young adult populations report an association between an early age at onset of panic and increased familial risk (Battaglia, Bertella, Bajo, Politi, & Bellodi, 1998; Battaglia et al., 1995; Iketani, et al., 2004), suggesting that a high genetic loading may be involved in EO PD (Battaglia, et al., 1995) and that EO PD may be a special clinical subcategory with a distinct biological basis (Segui et al., 1999). Findings amongst older adult samples are similar. For example, in a study of adults aged 60 and over identified as having early- or late-onset PD based on a cut-off of 35 years, Sheikh et al. (2004) found that 63% of older adults with EO PD had a family history of anxiety, versus only 39% of LO PD participants. Though this finding of difference was non-significant, it indicates a strong trend towards EO PD having a greater association with a positive family history of anxiety, in line with previous investigations of age at onset of PD in young adult samples (Venturello, et al., 2002).

On the other hand, LO cases of PD have been found to be associated with, and/or preceded by another psychiatric condition such as other anxiety disorders and mood disorders (Flint, 1997; Starcevic, Uhlenhuth, Kellner, & Pathak, 1993), alcoholism (Merikangas et al., 1998) certain medical conditions (Flint, 1997; Raj, et al., 1993), or other life events (Raj, et al., 1993; Sheikh, et al., 2004; Venturello, et al., 2002). For example, using a cut-off age of 60 years to distinguish early- from late-onset participants, Raj et al. (1993) found 29% of the EO sample and 10% of the LO sample to have mitral valve prolapse (MVP). This was well above the rate of 1.4% that is found in the general population for people by their eighth decade. As such, Raj et al. propose that MVP may be seen as a clinical marker for the

presence of PD. Parkinson's disease and chronic obstructive pulmonary disease (COPD) were also found to be highly prevalent among LO PD cases. In another study, Hassan and Pollard (1994) found that 85% of individuals with LO PD (i.e. onset of PD after the age of 60 years) had concurrent medical problems, particularly cardiovascular, gastro-intestinal (GI), and chronic pulmonary diseases. Furthermore, in 39% of these cases, the panic attacks began at the time of an acute medical illness (Flint, 1997). Comparisons with an EO sample were not made in this study.

In a study of EO and LO PD in a young adult sample identified using a cut-off age of 18 years, Venturello et al. (2002) found a significantly higher number of adult onset patients to report a greater mean number of life events than patients in the EO group. The number of LO PD patients who experienced at least one severe event was also higher. Their data indicates that the role of precipitating events in PD is significantly higher in the LO group, and that environmental factors are perhaps less relevant in the development of PD in EO patients. In line with this, in an earlier investigation in a sample of older adults, Raj et al. (1993) found a trend for subjects with LO PD (onset $\geq$ 60 years) to report a higher level of stress at the time of evaluation, with medical events and financial and interpersonal problems cited as stressors occurring prior to episode onset. These findings are not supported by those of Sheikh et al. (2004) who, using a cut-off of 35 years and older to distinguish LO PD from EO PD, found no difference between early- and late-onset groups of adults with late-life PD on number of life stressors experienced in the year prior to onset of PD, as assessed by the Psychiatric Epidemiology Research Interview Life Events Scale (PERI: Dohrenwend, Krasnoff, Askenasy et al., 1978; cited in Sheikh, et al., 2004).

3.3 Empirical Support for an Onset Distinction in the Phenomenology of Panic Disorder in Late-life

Preliminary studies (Sheikh, et al., 1991; Sheikh, et al., 2004; Sheikh, Swales, King, Sazima, & Bail, 1998) suggest possible age-related differences in the phenomenology, history and course of PD. Initial data suggests that among older PD patients, those with onset later in life (onset > age 55) are less symptomatic in some panic-associated domains, report less anxiety and arousal, report higher levels of functioning, present with less

avoidance behaviour compared to EO patients, and in general, have less severe PD (Hocking & Koenig, 1995; Segui, et al., 1999; Sheikh, et al., 1991). These findings are supported by those of Segui et al. (1999) who found LO PD patients with an onset age of 60 years and older to report less severity of PD than those with EO. Similarly, Katerndahl and Talamantes (2000) found that those with LO panic attacks (onset $\geq$ 50 years of age) typically represent a less severe form of disorder, with lower levels of comorbidity, less mental health services utilisation and a greater number of positive coping behaviours than those with EO panic attacks (onset < 50 years).

By contrast, a study of early versus late onset PD in a young adult sample by Iketani et al. (2004) revealed no significant differences between onset groups in number of DSM-III-R panic symptoms, frequency of panic attacks, prevalence of agoraphobia, or in scores on the Spielberger State-Trait Anxiety Inventory (STAI: Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) for patients whose onset of PD occurred before or after 25 years of age. Similarly, in a sample of older adults, Raj et al. (1993) reported that although LO (onset $\geq$ 60 years) participants were found to experience significantly more shortness of breath, with a trend towards reporting more chest pain or pressure, overall the symptoms experienced by both EO and LO patients during panic attacks were similar. Based on their findings, Raj et al. (1993) concluded that the data showed few differences between EO and LO panic in terms of phenomenology, suggesting that the two subtypes are not different disorders. These finding are consistent with those of Sheikh et al. (2004), who found that the number of panic symptoms endorsed on the Structured Clinical Interview (SCID-I/P: First, Spitzer, Gibbon, & Williams, 1995; SCID-P: Spitzer, Williams, Gibbon, & First, 1990) and severity of panic did not differ between onset groups distinguished by a cut-off of 35 years, in line with previous findings (Battaglia, et al., 1995; Goldstein, et al., 1997; Segui, et al., 1999) and consistent with findings of Iketani et al (2004). Sheikh et al. (2004) also found that older adults with early- and late-onset PD did not differ with respect to scores on the Beck Anxiety Inventory (BAI: Beck, Epstein, Brown, & Steer, 1988), the Agoraphobic Cognitions Questionnaire (ACQ: Chambless, Caputo, Bright, & Gallagher, 1984), and the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). As such, the relationship between age of onset and the phenomenology of late life PD remains unclear.

3.4 Empirical Support for an Onset Distinction in the Aetiology and Phenomenology of Agoraphobia in Late-life

In contrast to other anxiety disorders, studies that have examined the incidence and age at onset of phobias have found that many cases of agoraphobia in late life are a new onset (Eaton et al., 1989; Lindesay, 1991b). Lindesay (1991b) found that many older subjects with LO agoraphobia (onset $\geq$ 60 years of age) attributed the start of their fears to negative health events such as acute physical illness, falls, or to traumatic events such as muggings. Lindesay (1991b) also found an association between phobic disorders and early parental loss due to separation or death, suggesting that these early life experiences may confer a vulnerability to the development of phobias in old age (Flint, 1997).

In a study of risk factors and illness characteristics of agoraphobia in older adults, McCabe, Cairney, Veldbuizen, Herrmann, and Streiner (2006) found no differences in the proportion of individuals who reported early (onset $\leq$ 54 years) versus LO (onset $\geq$ 55 years) across age groups, marital status, education, first language, major depression, or panic attacks. In another study by Lindesay et al. (1989), agoraphobia was found to be more prevalent among women than men and this gender difference was found to decrease with increasing age, in line with findings of Krasucki, Howard, and Mann (1999). Older people who were widowed or divorced/separated were at higher risk of agoraphobia, whilst individuals who were married were at lowest risk. A sizeable proportion of agoraphobia cases in older persons reported LO, and thus McCabe et al. (2006) proposed that LO cases may have been precipitated by the loss of a spouse who may have acted as a protective factor for a vulnerable individual.

Regarding the hypothesis put forward by Lindesay (1991b), that the aetiology of agoraphobia in older adults may be more related to their health status, McCabe et al. (2006) found a higher prevalence of agoraphobia among individuals reporting at least one chronic health problem at the bivariate level, but no effect of chronic health problems in the multivariate model. Although the direction of the observed relationship is consistent with a possible increased risk of agoraphobia among those with medical illness, given the cross-

sectional nature of the study, it is possible that the causal direction is reversed and those with agoraphobia are more prone to health problems.

3.5 Empirical Support for an Onset Distinction in the Aetiology of Generalised Anxiety Disorder (GAD) in Late-life

Available data from older epidemiologic surveys suggest that approximately 50% of respondents aged 65 and older report an onset of GAD during childhood or early adulthood, and as having symptoms for most of their lives. The remaining respondents report developing GAD symptoms within the last five years (Blazer, Hughes, et al., 1991), indicating a bimodal distribution for age at onset of GAD (Beck, Stanley, & Zebb, 1996). Despite these findings, very little research has focused on onset differences in GAD in late-life. An early investigation of differences in the clinical symptoms of GAD by Hoehn-Saric, Hazlett and McLeod (1993) compared middle-aged adults with a childhood or adolescent onset of GAD to those with onset after the age of 20, in a sample aged between 23 and 60 years. The researchers found that difficulties in marital or sexual relationships, a past history of psychiatric illness, a disturbed home environment in childhood, symptoms of anxiety in childhood, inhibited or avoidant behaviour, and difficulties in social interactions during childhood differentiated the two onset groups. In particular, the EO group showed significantly greater dysfunction or severity on all of these variables. The samples investigated by Hoehn-Saric et al. (1993) did not include older adults however, limiting the generalisabilty of their findings to samples of older patients with GAD. Aside from this early study, only one other study had investigated the role of age at onset in the presentation of late-life GAD (Beck, et al., 1996) in over a decade, until a study by Le Roux et al. (2005). This gap in knowledge highlights the fact that despite its prevalence and potentially serious consequences, GAD in older adults has received relatively little research attention.

In an effort to gain more information on an age of onset distinction Le Roux et al. (2005) examined the distribution of age at onset and correlates of late-life GAD in a sample of older adults recruited for a psychotherapy study. Participants were distinguished as having early- or late-onset using a threshold of 50 years. No differences were found between onset

groups for age, gender, marital status or education. These findings are consistent with those of Beck et al. (1996) who, using an age cut-off of fifteen years or less to define EO and 39 years or greater to identify those with LO GAD in a sample of older adults, found onset groups to be similar with respect to age, education, gender, ethnicity, and amount of time spent worrying. EO and LO groups of older adults were also found to be alike with regard to gender, ethnicity, marital status, and employment status in an investigation of late-life GAD by Chou (2009). In contrast to previous findings however, Chou found respondents in the LO group (onset $\geq$ 50 years) to be significantly older than EO participants (age $<$ 50 years) and to have a significantly lower level of education than those in the EO group.

Regarding health characteristics, Chou (2009) found that onset groups were similar with regard to rates of various cardiac conditions, stomach conditions and arthritis. Among those with lifetime GAD (at least one episode of GAD), those with a LO were significantly more likely to report hypertension, poor role functioning, bodily pain and poor self-rated health than those with an EO. On the other hand, among those with current GAD (episode onset in the year preceding interview), EO and LO groups of older adults were not found to differ on these factors. In a study by Le Roux et al. (2005) EO patients were found to be taking psychotropic medications at a higher rate than LO patients, to have higher rates of a history of counselling and/or psychotherapy and to be significantly more likely to report psychiatric comorbidity. No significant differences were found between groups for number of medical conditions, self-rated health, or physical disability (Le Roux, et al., 2005). LO patients, however, reported significantly more limitations in role functioning due to physical problems. Based on these findings, Le Roux et al. (2005) suggest that role disability, as opposed to physical disability, may be a risk factor for the development of GAD in late life, consistent with findings from the LASA suggesting that functional impairment is strongly associated with anxiety (Beekman, et al., 1998). These findings are not however supported by those of Lenze et al. (2005), who found no differences between early- and late-onset groups of GAD patients in activities of daily living (ADL) score, and cite no support for hypothesised differences in disability as being greater in LO cases (i.e. those with onset of GAD at 60 years of age or older).

With regard to stressful life events, Le Roux et al (2005) did not find participants with LO symptoms of GAD to be more likely to have experienced negative life events such as widowhood, poor health or cognitive impairment than those with EO GAD. These findings are consistent with those of Lenze et al. (2005), who found no differences between the EO and LO GAD groups in age, mini-mental state examination (MMSE) score, rates of cardiovascular illness, and rates of cerebrovascular illness. Both Lenze et al. (2005) and Le Roux et al. (2005) note that findings of no difference in physical health, cognitive impairment and other negative events may be a result of lack of sensitivity of the measures selected.

The role of psychological risk factors such as locus of control and self-efficacy has not previously been examined in investigations of an onset distinction in late-life anxiety disorders. In a previous study by Hoehn-Saric et al., (1993), the Eysenck Personality Inventory (EPI: Eysenck & Eysenck, 1975) was used to assess personality traits of introversion, extraversion, and neuroticism. Analyses revealed that the EO group scored significantly higher on the neuroticism scale of the EPI than the LO group. These findings, along with higher scores on a measure of trait anxiety and a more obsessive personality as rated by the Psychiatric History Rating Scale (PHRS) for the EO group, led the authors to conclude that EO patients differ from those with LO GAD with respect to vulnerability to anxiety (Hoehn-Saric, et al., 1993).

3.6 Empirical support for an Onset Distinction in the Phenomenology of Late-life GAD

In a review of patients with GAD in a middle-aged sample, Hoehn-Saric et al (1993) found that patients with an onset in childhood or adolescence (onset < 20 years of age) did not differ with regards to symptoms of anxiety from those who had an onset after 20 years of age. Based on their findings, Hoehn-Saric and colleagues concluded that once GAD is developed, the anxiety symptoms become similar in the two groups. That is, if patients were assessed solely by DSM-III-R criteria for GAD, one would not find a difference in the two sub-groups. In line with these findings, Beck et al. (1996) compared a sample of older adults with EO GAD (onset ≤ 15 years of age) to those with LO GAD (onset ≥ 39 years)

and found no significant differences between groups on the STAI State -Scale (STAI-S: Spielberger, et al., 1983), the Hamilton Anxiety Scale (HAM-A: Hamilton, 1959), the Penn State Worry Questionnaire (PSWQ: Meyer, Miller, Metzger, & Borkovec, 1990) or on the BDI (Beck, et al., 1961). Early-and late-onset groups were also found to be similar with regards to the severity of worry about finances, health, and social concerns using the Worry Scale (WS: Wisocki, Handen, & Morse, 1986) to assess the severity of worry in these three domains. Participants with EO GAD were however found to report significantly higher trait anxiety on the STAI Trait -Scale (STAI-T: Spielberger, et al., 1983). They were also rated as more depressed on the Hamilton Rating Scale for Depression (HRSD: Hamilton, 1960) and were found to have a higher level of clinician-rated severity of GAD as compared to the LO sample, though this trend was noted to be marginally significant ($p < .055$). As a result of their findings, Beck and colleagues (1996) concluded that examination of age of onset suggested few differences between those adults reporting worry onset during childhood and adolescence versus adulthood.

On the other hand, Le Roux et al. (2005) found partial support for their hypothesis that EO patients would experience more severe symptoms than LO patients and that the clinical presentation of GAD differs between those with EO and LO. Specifically, they found that EO patients had significantly higher scores on the PSWQ (PSWQ: Meyer, et al., 1990), and had greater interviewer-rated GAD than LO patients. Findings of Le Roux et al., (2005) also indicated that pathological worry appears to be more prominent relative to somatic anxiety symptoms or depressive symptoms in adults with an EO of GAD. However, no significant differences were found between groups in overall anxiety or depressive symptoms on scales that assessed anxiety or depression more broadly, for example, the Beck Anxiety Inventory (BAI: Beck & Steer, 1993), the BDI (Beck, Steer, Ball, & Ranieri, 1996) or the HAM-A (Hamilton, 1959).

3.7 Summary of Empirical Support for an Onset Distinction in Late-life Anxiety Disorders

The literature reviewed in the preceding section indicates that the risk factors associated with early- and late-age of onset in a variety of anxiety disorders may differ, and may contribute to differences in the aetiology and phenomenology of anxiety in late-life. Overall the evidence suggests greater psychiatric comorbidity, family history of anxiety, and increased clinical severity of symptoms in those with EO of an anxiety disorder. In contrast, LO anxiety disorders appear to be associated with greater experiences of life stress, such as physical and/or medical illness, and experiences of loss and traumatic events leading up to the onset of anxiety. Findings of differences relating to the phenomenology of late-life anxiety disorders are mixed however.

With regard to panic-related symptoms, there is some support for greater severity of clinical symptoms and increased comorbidity in patients with EO PD as compared to those with LO PD (Goldstein, et al., 1997; Iketani, et al., 2004; Sheikh, et al., 1991; Sheikh, et al., 2004). On the other hand, other studies report no difference in clinical severity of symptoms (Battaglia, et al., 1995; Segui, et al., 1999). Mixed findings are similarly reported for GAD, with Le Roux et al. (2005) reporting EO patients to experience more severe symptoms than LO patients with respect to worry and interviewer-rated GAD, consistent with the findings of Shores et al. (1992). Alternatively, the findings of Beck et al. (1996) suggest few differences in psychopathology between those adults reporting worry onset during childhood and adolescence vs. adulthood. As such, the literature is unclear as to whether there is an onset distinction in aetiology and phenomenology of late-life anxiety disorders.

3.8 Limitations in Age of Onset Research in Late-life Anxiety Disorders

Whilst the literature reviewed in the foregoing sections of this chapter indicates that early- and late-onset anxiety disorders may differ with regard to aetiology and phenomenology, findings in support of such differences are mixed. There are a number of limitations in onset research that may contribute to this variability in findings. Specifically, there is a lack of consistency as to the thresholds used to define and distinguish early- and late onset

groups in the study of geriatric disorders. Accordingly, cut-off points selected for defining early- and late-onset vary widely between studies. This variability in cut-off age and lack of evidence to support the choice of a specific cut-off, in addition to differences in measures used to elicit and identify age of onset, may be significant factors as to the mixed findings of difference between early- and late-onset anxiety disorders.

Despite evidence of initial onset of PD in later life (Frances & Flaherty, 1989; Hassan & Pollard, 1990; Luchins & Rose, 1989), there is generally no accepted cut-off age for distinguishing early- versus late-onset in late-life PD. Age cut-offs for defining "late-onset" in studies of PD in older adults have ranged from 20 to 60 years (Katerndahl & Talamantes, 2000; Segui, et al., 1999; Sheikh, et al., 2004). In a study investigating differences in the phenomenology and course of PD relating to age of onset in older adults, Sheikh et al. (2004) report that their decision to use a cut-off of 35 years was based on findings of the Epidemiological Catchment Area (ECA) study, according to which onset of most cases of PD is between ages 25-29, followed by age 30-34, after which the numbers fall precipitously. Similarly, in a study of EO and LO PD in Japan, Iketani et al., (2004) defined EO as $\leq$ 25 years, and LO as over 25 years, according to the distribution of age at onset in the sample, a median age of 24 years in the ECA study (Burke, et al., 1990), and the cut-off age typically used in previous research (Sheehan, Sheehan, & Minichiello, 1981).

These studies appear to have selected the chosen cut-offs to differentiate early- from late-onset based on observation of the distribution of onset in a large scale epidemiological study (ECA; (Burke, et al., 1990), and are in line with the theoretical understanding that onset of psychiatric illness typically occurs early in life (Barlow, 1988). On the other hand, in an investigation of the clinical characteristics of panic disorder in a sample of older adults (Raj, et al., 1993), clinical records of all inpatients and outpatients of a geriatric service were retrospectively reviewed for a diagnosis of PD with or without agoraphobia at discharge. For the purposes of investigation these patients were assigned to the EO group if onset of PD occurred at 59 years or earlier, and to the LO group if onset occurred at age 60 years or later. This latter study by Raj et al. (1993) and previous investigations of age at onset and late-life PD (Segui, et al., 1999; Sheikh, et al., 1991) have used a much later cut-off to distinguish early-from late-onset groups (i.e., 55-60 years). Moreover, given that

analyses were performed on data not initially collected for the purposes of onset research, Raj et al. (1993) did not outline a procedure for how age at onset was identified. As such, it is also unclear as to whether individuals identified as having a diagnosis of PD were experiencing their first episode of PD, or whether their diagnoses at discharge represented a recurring disorder.

In a study investigating the risk factors and illness characteristics of agoraphobia in older adults, McCabe et al. (2006) used data from the Canadian Community Health Survey – Mental Health and Well Being (CCHS 1.2) in order to determine the proportion of agoraphobics in their sample who experienced an initial onset after the age of 54, defined as LO in their study. The CCHS 1.2 incorporated the use of the World Mental Health Composite International Diagnostic Interview (WMH-CIDI), a structured, lay-administered diagnostic interview generating International Classification of Diseases (ICD-10) and DSM-IV diagnoses. The WMH-CIDI allows for retrospective age-of-onset reports to be obtained, with an emphasis on the importance of accurate responses to questions, for example, "Can you remember your exact age the very first time you (had the syndrome)? Respondents who answer 'no' can be further probed for a bound of uncertainty by moving up the age range incrementally (e.g., "was it before you started school?" "Was it before you became a teenager?"). Despite the wealth of information that is gathered about age at onset using the WMH-CIDI, it appears that McCabe and Colleagues did not use this information to inform selection of a cut-off for distinguishing between early- and late-onset groups, which would be reflective of the distribution of age at onset in their sample. Rather, McCabe et al. selected a cut-off point of 55 and older to represent those with LO; whilst adults aged 15-54 represented the EO group. The researchers' selection of this particular cut-off was based on reasoning that many large-scale surveys of psychiatric disorders in the general population such as the National Comorbidity Study (NCS: Kessler, et al., 1994); NCS, 1994) exclude adults over 54 years.

The study by McCabe et al. (2006), together with cut-offs used to define 'LO' in investigations of late-life PD points to the fact that selection of a cut-off age for 'LO' across onset research appears to be based on theoretical grounds of what defines old age and age of onset, though this age in itself can vary between studies. Further, there appears to be

little consideration of the distribution of age at onset ascertained in any given sample in informing a cut-off that might distinguish samples according to age at onset. Reporting on onset distributions in such studies would not only establish a knowledge base allowing for identification of patterns or trends in distribution of onset, but would allow for thresholds to be based on such a distribution rather than arbitrarily selected cut-offs. Unlike other anxiety disorders that show mixed findings, a bimodal distribution in age of onset is fairly well documented for GAD (Blazer, George, et al., 1991; Regier, et al., 1988). As such, older adults suffering GAD may represent a heterogeneous group consisting of those with an onset of symptoms at an early age with a chronic course, and those who appear to develop a disorder later in life following a stressful life event (Hoehn-Saric, et al., 1993).

According to Beck et al. (1996), one of the major problems in making comparisons between findings of onset differences and in replicating these findings is the selection of an arbitrary cut-off age for the determination of GAD onset. Beck et al. (1996) note that this approach does not take into account the current age of the patient in relation to GAD duration. As illustrated by Beck and colleagues, if a cut-off age of 21 is selected, this strategy would result in both a 25-year-old having GAD for one year and a 50 year-old with a 30 year history of GAD being categorised as having LO. To address this limitation, Beck et al.'s (1996) investigation of age at onset included a group of older GAD patients whose excessive worry began before the age of fifteen, identified as the EO group, and those with excessive worry beginning after the age of 39, identified as the LO group. The authors' rationale for selection of the respective age-cut-offs was to form two discrete groups with clearly differing recollections of the onset and duration of excessive worry, and to reflect the bimodal distribution of age at onset in their sample. Contrary to expectations about the impact of GAD duration on selection of cut-off points for identifying early- and late-onset groups, findings of few differences between the two groups led Beck et al. (1996) to conclude that, given both the EO and LO samples in their study had experienced GAD symptomatology for a number of years, it was unlikely that the duration of the disorder was central in their findings.

Despite highlighting the problem of onset research as being related to the selection of arbitrary cut-off ages (Beck, et al., 1996), the cut-offs selected by Beck and colleagues to

distinguish early- and late-onset groups appear to be equally arbitrary. According to their classification of EO and LO groups, patients with an onset occurring between the ages of 16-38 years (i.e. over a 23-year period) were unaccounted for, despite this age range being the period during which the onset of anxiety disorders is typically thought to occur (Barlow, 1988; Flint, 1994), and at which anxiety disorders are considered to be at peak prevalence (Regier, et al., 1984). The failure to consider onset of GAD within this age-range further contributes to the current difficulties in drawing conclusions about findings of difference between early- and late-onset GAD in later life.

An investigation of age at onset of late-life GAD by Le Roux et al. (2005) included participants aged 55 and over who were categorised as having early-or late-onset GAD based on onset of symptoms occurring before or after the age of 50. Diagnostic interviews were conducted using the Anxiety and Depression Interview Schedule for DSM-IV (Di Nardo, Brown, & Barlow, 1994). The researchers note that this version was used as opposed to the lifetime version (ADIS-IV-L: Brown, Di Nardo, & Barlow, 2004) in order to reduce the time and burden of the assessment process for participants. As a result, onset information was only collected on participants' presenting episode and not lifetime episodes. Given that the course of GAD can wax and wane with periods of wellness between onsets, it remains unclear as to whether the LO sample in their study consisted of participants whose first onset was after the age of 50, or whether this group included a proportion of participants with recurring disorders, many of whom may have had an initial onset much earlier in life.

3.9 Summary of Limitations in Onset Research

Although interest in research of an onset distinction amongst geriatric anxiety disorders is increasing, the literature reviewed in the foregoing sections of this chapter points to an inconsistency across the onset literature with regards to definitions of LO, the thresholds used to determine early and late-onset groups, and the methodology utilised in eliciting age of onset across studies. In reviewing studies of late-life anxiety, a failure to assess lifetime episodes of illness onset has led to a lack of clarity as to whether 'LO' refers to the onset of a disorder for the first time in late life without a prior history of illness, or merely the first

onset to occur in later life after a threshold selected by the researcher. The implication of failing to assess lifetime episodes using interview schedules that only allow for measurement of a patients' presenting disorder is that patients classified as having a LO disorder may be misclassified as earlier remitted episodes of illness go unassessed, as is the case in previous research (Beck, et al., 1996; Le Roux, et al., 2005). This variability across the research literature has implications for drawing conclusions about differences between older adults with early- and late-onset anxiety.

Measures used to elicit and identify onset in the studies reviewed vary from semi-structured to structured, with some being lay-administered, whilst others are clinician-rated. As a result of these approaches to onset research, there is the potential for data to be compromised by inadequate or inappropriate measures of anxiety, lack of clarity about definitions of 'age at onset,' inconsistent cut-offs selected to determine onset groups, and methodology that is not necessarily suited to the research question. In investigations of onset differences, cut-off points have ranged from as early as fifteen years in studies of GAD in older adults (Beck, et al., 1996) to 60 years in studies of late-life GAD, agoraphobia and PD (Chou, 2009; Le Roux, et al., 2005; McCabe, et al., 2006; Raj, et al., 1993). This further makes comparisons of findings between studies of onset difficult, and highlights the need for some methodological agreement as to cut-off selection for studies of onset. In addition, many of these studies do not report the distribution of onset in their samples, rather reporting on means and medians of the distribution instead. Reporting on these distributions would allow for the observation and/or establishment of trends or patterns in onset, which may better inform appropriate thresholds to distinguish between sub-groups of anxiety with onset across the lifespan.

A related concern with regards to anxiety research in general, as highlighted by Flint (2005a), is the need for hypothesis-driven research, where late-life anxiety disorders are the *a priori* focus. Flint notes that much of the existing literature relating to anxiety in older adults is based on secondary analyses of data from studies that did not set out to investigate anxiety. This is also evident in research relating to an onset distinction amongst anxiety disorders, where secondary analyses have been conducted on data from studies that did not initially set out to investigate the existence of differences in onset, as seen in the PD

literature (Raj, et al., 1993), and research relating to onset differences in GAD (Hoehn-Saric, et al., 1993; Le Roux, et al., 2005; Lenze, et al., 2005). This appears to be more evident in onset literature relating to anxiety disorders than in the depression literature, reflecting the fact that anxiety as a construct, particularly in later life, is less well studied than depression (Flint, 2005a).

3.10 Conclusions

Despite preliminary evidence suggesting that early- and late-onset anxiety disorders can be considered as two distinct subgroups and that these subgroups may be distinguished by aetiological and phenomenological factors, the limitations in current research outlined in the foregoing sections of this chapter highlight the need for research that will clarify and extend the existing knowledge regarding such differences. Specifically, there is a need for theoretical clarity regarding this distinction. Cognitive theories of anxiety postulate that certain cognitive styles (such as the tendency to respond anxiously to stress, and the perception that events are out of one's control) provide a predisposition to anxiety. These theories predict that anxious behaviour develops when negative life stressors interact with these predisposing cognitive styles. Accordingly, anxiety is a product of an interaction between environmental conditions and internal vulnerabilities (diathesis-stress models). The applicability of such models has been investigated in older adults, but has not yet been applied to the early-versus late-onset anxiety distinction. The applicability of a diathesis-stress model of anxiety will be discussed in the following chapter, with a view to investigating a model that might distinguish the content and process of early- and late-onset anxiety.

CHAPTER FOUR

A Theoretical Explanation to Account for a Distinction in Early- and Late-onset Anxiety in Late-life

In light of the fact that empirical investigations of an age at onset distinction amongst the anxiety disorders is a relatively recent phenomenon, no model has yet been put forward to account for this distinction amongst anxiety disorders in late-life. Moreover, although there exists a well-established body of literature investigating an age of onset distinction in late-life depression, until a review of psychological perspectives of early- and late-onset depression in older adults by Boyd et al. (2000), no theories had been put forward or tested to account for this distinction in depression. In their review, Boyd and colleagues focus on psychological perspectives of the early-versus late-onset depression distinction, and consider this distinction within the context of theories of aging.

Beck's (1987) cognitive theory of depression developed to account for depression in younger adults is highlighted as having potential utility in developing theories of late-life depression, and as being particularly pertinent to the early-versus late onset distinction. Boyd et al. (2000) therefore develop a cognitive model of early- and late-onset depression based on theoretical underpinnings of this theory. Since anxiety and depression are closely related disorders (Barlow, 1988; Barlow & Campbell, 2000; Mineka, et al., 1998), including in late-life (Beekman, et al., 2000; de Beurs, et al., 2001; Flint, 1997), and there is a need for theoretical clarity regarding this distinction amongst anxiety disorders in older adults, the model put forward by Boyd and colleagues will be outlined in this chapter with a view to empirically investigating its applicability in accounting for an age of onset distinction in late-life anxiety.

4.1 A Cognitive Model to Account for Late-life Depression

According to Boyd et al. (2000), accounts of late-life depression based on theories of aging (Brandstadter & Renner, 1990; Cumming & Henry, 1961; Erickson, 1950, 1980, 1997; Erickson, Erickson, & Kivnick, 1986; Havighurst, 1963; Labouvie-Vief, DeVoe, & Bulka, 1989) emphasise factors that are specific to late life. Accordingly, these theories of aging do not allow for the possibility that mechanisms involved in late-life depression may be related to those involved in depressive episodes earlier in the lifespan. An alternative perspective proposed by Boyd et al. (2000) posits the aetiological mechanisms responsible for early and late-life depression to be similar, noting that "although factors unique to late life would be important, theoretical models of early-life depression would also have valuable contributions to make to the understanding of late-life depression" (Boyd, et al., 2000, p. 154).

4.2 Development of a Cognitive (diathesis-stress) Model to Account for Early- and Late-onset Depression

According to cognitive theories of psychopathology, certain cognitive (thinking) styles provide a predisposition to psychopathology. Consequently, anxiety or depression arises as the result of an interaction between negative life stressors (environmental conditions) and these predisposing cognitive styles (internal vulnerability), described as diathesis-stress models. The stress-diathesis models of illness propose that most psychiatric disorders arise as a result of environmental adversity experienced by predisposed individuals. Since old age can be a period of chronic stress and significant loss (Brandstadter, Rothermund, & Schmitz, 1997), diathesis-stress models such as Beck's (1987) cognitive theory of depression may have particular utility in explaining the anxiety experienced by older adult populations. Abramson, Metalsky & Alloy (1989) propose that diathesis-stress models can be viewed as 'titration models,' whereby the less maladaptive a person's cognitive style and thus initial vulnerability, the more negative an event must be to interact with that style and induce depression (Boyd, et al., 2000).

Drawing on diathesis-stress models, Boyd et al. (2000) propose that some older adults remain free of depression until late-life because although they have some cognitive vulnerability to psychopathology, they do not experience significant life stressors until old age. Boyd and colleagues also put forward an alternative hypothesis that proposes LO depression to be triggered by stressors that are specific to late life, e.g. those of an uncontrollable or irreversible nature (Seligman & Elder, 1986). Drawing on a titration perspective as previously defined (Abramson et al., 1989), a third explanation is that in older adults EO depression may be associated with greater vulnerability to depression than LO cases, and consequently, depression in EO cases may be triggered by lesser degrees of stress or fewer stressful events/experiences. In contrast, adults with LO are posited to have less dysfunctional thinking styles and lower levels of cognitive vulnerability, but a late life that is extremely stressful (Boyd, et al., 2000).

This latter view is consistent with the argument put forth by Kendler, Myers and Prescott (2002). According to Kendler et al., the stress-diathesis model predicts that among affected individuals, an inverse relationship exists between the level of the diathesis (or liability) and the level of onset-related environmental trauma. As such, affected individuals whose onset was associated with high levels of trauma should, on average, have lower levels of disease liability than affected individuals with little or no trauma associated with onset. Boyd et al. (2000) report that although none of these hypotheses have been investigated by direct empirical examination, there is some evidence to support the third hypothesis, presented diagrammatically in Figure 4.1. As outlined in the following section, this is considered to be the most plausible model of EO and LO depression by Boyd and colleagues.

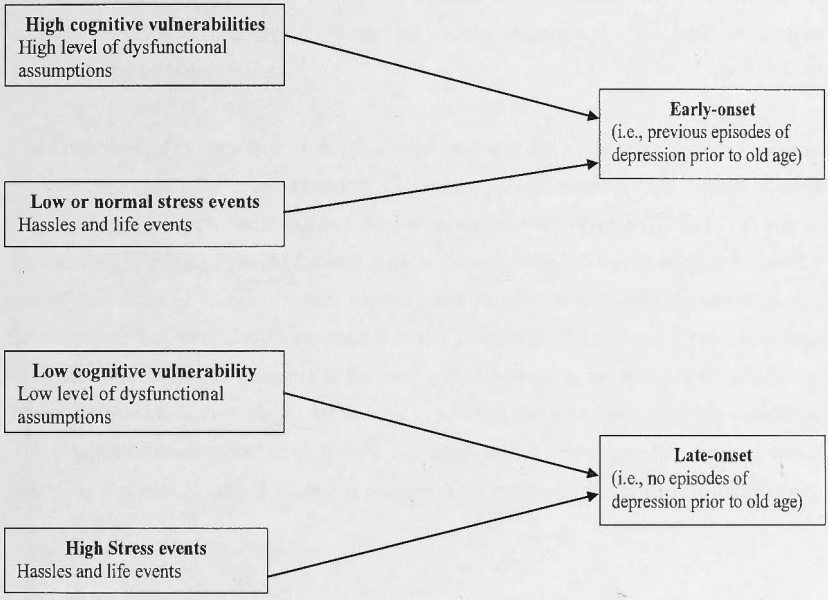


Figure 4.1. Cognitive model of early- and late-onset depression (cited in Boyd, et al., 2000)

4.3 Evidence Supporting a Cognitive Model of an Early- and Late-onset Distinction

Drawing on the cognitive vulnerability model proposed, Boyd et al. (2000) cite some evidence for the proposition that EO depression is associated with a greater internal vulnerability to depression, whilst LO depression is associated with greater levels of life stress. For example, Boyd et al. report that a number of studies have found EO depression to be associated with a fragile personality style while LO depression is associated with a more robust personality style (Abrams, Alexopoulos, & Young, 1987; Brodaty et al., 1991; Roth, 1955), providing support for the hypothesis that EO depression is associated with

greater internal vulnerability than LO depression. Furthermore, in a study of life stressors and depression, Musetti et al. (1989; cited in Boyd, et al., 2000) found LO depression to be associated with more life stressors in the six months leading up to the onset of clinical depression than EO depression.

Consistent with the cognitive model of early- and late-onset depression, there is some evidence to support the proposition that EO anxiety is associated with a greater internal vulnerability to anxiety, while LO disorders are associated with greater levels of life stress. For example, Lindesay (1991b) found that older subjects with LO agoraphobia attribute the start of their fears to traumatic events such as acute physical illness, falls, or muggings. On the other hand, Keller (2002) reported that the incidence of LO anxiety disorders was associated with more life stressors in the twelve months leading up to the onset of clinical anxiety. Although further studies are needed to confirm these findings, they are consistent with a diathesis-stress model of early- and late-onset anxiety, proposing that environmental precipitants appear to play a more important role in the onset of LO than in EO anxiety among older adults.

4.3.1 Summary

A review of the literature suggests that consideration of stress-diathesis models in accounting for an onset distinction in late-life psychopathology can help further our understanding of the experience of anxiety in older adults. Stress-diathesis models are able to outline the way in which people come to develop anxiety, and propose a variety of factors that contribute to the onset and maintenance of anxiety as people age. It is proposed that when anxiety begins early in life, social, psychological and biological processes that characterise early life (for example, experiencing adverse events, genetic factors, and personality traits) will be most important to understanding the development of anxiety. Conversely, if onset occurs in late life, developmental processes important in late life (e.g. increasing experiences of negative life events and declines in physical/medical health) may play an essential role in both the onset and maintenance of the disorder. A review of the literature indicates that adverse events can occur at a relatively high rate in older adults, which can be serious in nature (e.g. death of a loved one, reduced finances, or personal illness) (Hughes, George, & Blazer, 1988). Furthermore, support has been found for the

proposition that there is a positive relationship between such stressors and psychological symptoms (Beekman, et al., 1998; Lenze, et al., 2002). Despite the association between adverse life-events and anxiety, not everyone who experiences an adverse event develops an anxiety disorder. The psychological variables that are well established as vulnerability factors for anxiety in late-life, in addition to the stress-related events considered to play a role in the distinction of early and late-onset anxiety in older persons are thus outlined in the following subsection of the present chapter, with a view to investigating the contribution of these factors to an age of onset distinction in late-life anxiety in subsequent chapters of this thesis.

4.4 Psychological Vulnerabilities Contributing to an Age of Onset Distinction in Late-life Anxiety

4.4.1 Trait anxiety

Trait anxiety, defined as a *vulnerability* to respond anxiously to stress and psychological threat, has been found to be elevated in anxious patients. Spielberger (1975, 1985) holds that people with high trait anxiety are more vulnerable to stress and interpret a wider range of situations as being dangerous. Furthermore, the frequency and intensity of anxiety states that have been experienced in the past is posited to provide a basis for predicting the probability that anxiety reactions will be manifested in the future (Spielberger, 1985). Trait anxiety has previously been utilised as a measure of psychopathology in investigations of an onset distinction in late-life GAD (Beck, et al., 1996; Le Roux, et al., 2005) and may have some explanatory value in the cognitive model of EO and LO anxiety with regards to measuring an individuals' tendency to respond to anxiety.

4.4.2 Anxiety sensitivity

Anxiety sensitivity (AS) is an individual difference variable that refers to the fear of anxiety symptoms as they are believed to have harmful somatic, psychological, or social consequences (Reiss, 1991; Reiss & McNally, 1985). Examples include the belief that a rapid heart rate is a sign of an impending heart attack and that nervous shaking is a sign of

mental illness. AS has been found to be elevated in anxious patients generally. There also exists converging evidence that anxiety sensitivity acts as a specific risk factor in the development of anxiety pathology (Schmidt, Santiago, & Wernicke, 2001). PD is specifically linked with heightened AS (Watkins, Grossman, Krishnan, & Blumenthal, 1999).

For older adults with a long history of panic symptomatology, AS may be acquired like other fears through a variety of psychosocial experiences, and may function to increase the individual's vulnerability for panic attacks and/or disorder for the first time in late life. Late-life increases in AS may occur, or pre-existing AS may interact with life stressors specific to this developmental period. As older adults experience an increasing number of physical illnesses, for example cardiovascular disease, they may become more concerned about related bodily sensations, and more reactive to anxiety symptoms that involve these bodily sensations. For these individuals, elevation in AS may develop as a complication of deteriorating physical health and place the individual at greater risk for panic symptoms and panic disorder. Alternatively, longstanding minor elevations in AS may interact with the myriad of life stressors occurring in later life (e.g. retirement, death of a spouse), causing such individuals to react catastrophically to stress precipitated increases in anxiety.

4.4.3 Worry

Worry in its relation to anxiety problems is regarded as pathological and an important clinical phenomenon. The cognitive phenomenon of worry is thought to be central to the experience of anxious affect (Diefenbach, Stanley, & Beck, 2001). Worry also seems to be at least partly independent of somatic arousal, which could render it a specific cognitive process distinguishable from any broader construct of anxiety (Gladstone & Parker, 2003). Thus, worry may be an important 'process' factor in distinguishing between early- and late-onset anxieties.

Based on increased stressors associated with ageing such as loss and declining health, research indicates that older adults are more inclined to worry. In a study with older adults who self-identified as chronic worriers, Wisocki, Hunt, and Souza (1998: cited in Hunt,

Wisocki, & Yanko, 2003) found participants to report that their worries grew in intensity over the lifespan and that in general 'worries are deeper, more morbid, and stronger in the later years' (p. 12) when compared with the worries of a younger population. Furthermore, one's sense of control or mastery over life events is thought to be relevant in the assessment of worry-proneness, as increased levels of worry have been found to be associated with decreases in perceived control, due to real or perceived declines in physical health (Diefenbach, et al., 2001). As such, worry may be considered amongst the cognitive vulnerabilities that are exacerbated in late life due to experiences of stressors, consistent with the findings of Le Roux et al. (2005) who reported significantly higher scores on a measure of pathological worry in those with late-onset GAD, than in those with an early-onset.

4.4.4 Perceived control/locus of control

Perceived control (PC: Lefcourt, 1980; Phares, 1976; Rotter, 1966), defined as one's personal influence over outcomes or events in the environment, has consistently been found to relate to general health, health-related behaviours, and longevity (Chipperfield, Campbell, & Perry, 2004; Krause & Shaw, 2000; Prendant & Lachman, 2001). Research indicates that a lack of perceived control can result in subjective, behavioural, and physiological indications of distress (Rapee & Barlow, 1989; cited in Rapee, Craske, Brown, & Barlow, 1996). Moreover, it has been demonstrated that repeated experience with uncontrollable, aversive events can lead to chronic pathological emotional states, including anxiety and depression, in some individuals (Abramson, Seligman, & Teasdale, 1978; Barlow, 1988). These aversive events may be external threats and stressors, or internally generated sensations. A sense of lack of control over emotional and bodily reactions is viewed as a crucial element in some emotional disorders. Specifically, Barlow (1988) suggests that the unexpected experience of bursts of focal or discrete emotions may lead to anxiety or affective disorders in vulnerable individuals. This is because they view their own emotions or bodily reactions as out of control. For example, in PD, vulnerable individuals who unexpectedly experience an intense, short-lived burst of the discrete emotion of fear then develop "anxiety" over the possibility of the reoccurrence of this response in an uncontrollable manner.

Based on these findings, it appears that the degree to which people view events as within their control can become a dispositional characteristic. As such, this trait may be a fundamental mediator of motivation and psychopathology (Barlow, 1988; Rotter, 1966, 1975). According to Rotter (1966), individuals differ in the degree to which they perceive reinforcement as being contingent on their behaviour. Accordingly, an individual who believes that reinforcement is a result of his or her own actions is described as having a high belief in 'internal control'. 'External locus of control' is the perception that an event is not entirely contingent on one's own actions, but is the result of luck, chance, fate, or powerful others (Rotter, 1966). As a personality dimension, it has been construed as a relatively broad, generalized expectancy (Rotter, 1966, 1975), as well as more specific expectancies regarding control over limited areas of one's experiences.

Johnson and Sarason (1979) suggest that locus of control (LOC) may mediate the effect of life change, and have found significant positive correlations between anxiety, depression, and negative life change for those with external LOC, but not for internal LOC. Empirical evidence from clinical samples conclude that a loss of control and greater externality (i.e., attribution of control to sources outside oneself) are associated with elevations in anxiety symptoms in older adults (Hoehn-Saric & McLeod, 1985; Rapee, et al., 1996). Older adults are considered 'doubly vulnerable' to the deleterious effects of uncontrollability, as their sense of control can be diminished by age-related declines in physiology (e.g., diminishing functional capacity) and losses in their social environment (e.g., death of loved ones). In general, studies of institutionalised and community-dwelling samples support the interpretation that having a greater sense of personal control is associated with better health among older adults (Arbuckle, Pushkar, Chaikelson, & Andres, 1999).

4.4.5 Self-efficacy

Self-efficacy expectancies are characterized as beliefs about one's ability to carry out specific behaviours or behavioural sequences (Stanley, Novy, Hopko, Beck, Averill, & Swann, 2002). Although the majority of self-efficacy research has been conducted with young and middle aged adults (Bandura, 1997; Maddux, 1995), some data have

documented correlations of expectancies with affective and behavioural responses in older individuals. In this age group, perceptions of efficacy and control have been suggested to be even more important predictors of behaviour, health, and adjustment than for younger individuals (Rodin, 1986; Welch & West, 1995). In fact, research with older adults has indicated significant relationships between expectancies and health risk status (Grembowski, Patrick, Diehr, Durham, Beresford et al., 1993), fear of falling and associated behaviours (Tinetti, Richman, & Powell, 1990), changes in functional status (Mendes de Leon, Seeman, Baker, Richardson, & Tinetti, 1996), cognitive performance (Seeman, Rodin, & Albert, 1993), and various measures of adjustment, physical and health status, and affect (Waller & Bates, 1992). Whilst there is some evidence to suggest lower levels of self-efficacy in older adults with GAD relative to published data from younger adult control samples (Stanley, Novy, Hopko et al., 2002), to date, no studies have reported on the relationship between self-efficacy and an age of onset distinction in late-life anxiety.

4.5 Stress-related Factors

An extensive literature has been put forth on the relationship between life events and mental disorders over the past three decades (Newman & Bland, 1994). According to Davies (1996), an "event" is historically seen as a discrete incident (such as a death or an accident), which is distinguished from chronic problems such as disablement, and from the more minor but frequent irritations of daily life. The relationship between stressful life events and the onset of major depression has been demonstrated in the research literature (Costello, 1982; Paykel, 1978). Despite research indicating that stressful life events also precede episodes of anxiety disorders (Faravelli & Pallanti, 1989; Finlay-Jones & Brown, 1981), relatively little is known about the relationship between stressful life events and anxiety, and even less so about this relationship in older adults.

In a study of the association between life events and anxiety in adult populations, a comparison of PD patients with normal controls by Faravelli and Pallanti (1989) revealed more life events in the patient group before the onset of the disorder. A study of community residents who were followed up over the course of a year by Blazer et al. (1987) found an increased risk of GAD when the respondents experienced life events classified as

"negative," "unexpected," or "very important." In another study of stressful life events and the onset of anxiety and depressive disorders, Finlay-Jones and Brown (1981) found that life events characterised by 'loss' were more prominent in patients with a depressive disorder, whereas patients with anxiety reported life events described as 'dangerous.' Findings of these studies indicate that for certain categories of life events, there is a correlation between excessive events and the type of disorder that develops as a result of such experiences. In addition, concurrent events are thought to affect well-being negatively, even though each event separately may cause relatively little stress (Kraaij, Arensman, & Spinhoven, 2002). Life events can have a cumulative negative impact on well-being, as it is not uncommon for older adults to experience several different events over a short period of time.

As people age, events may disturb the course of one's' life more frequently, and because losses become more frequent than gains, they can decrease a person's sense of control of the external environment (Clemence, Karmaniola, Green, & Spini, 2007). Health events are reported to be the most common negative events to affect older persons, occurring in over a quarter of a community sample during a twelve-month period (Davies, 1996). The prevalence of anxiety and depression is higher in physically ill older people (Beekman, Pennix, Deeg et al., 1997; Bryant, Jackson and Ames, 2007). The illnesses of old age tend to have a chronic course, fluctuating severity of symptoms (Hickey & Stilwell, 1992), and recent onset of disablement is known to pose particular adjustment problems (Reich, Zautra, & Guarnaccia, 1989). Older people with disability have many adaptive tasks to achieve and reduced resources at their disposal. In addition, they may have to deal with pain, fatigue and incapacity, as well as having to learn to detect and manage their symptoms.

The psychological response to physical illness in older adults is influenced by a number of factors, including the organ and functional system affected, severity of impairment, and the rapidity of onset and decline (Davies, 1996). In general, acute-onset events such as a stroke, which entail sudden loss of function, will be harder to adapt to than gradual disability imposed by a slower onset condition such as arthritis, where adjustments can be made in a relatively private way over a period of time (Davies, 1996). Prior lifestyle and previous

experience of illness and treatment also influence adjustment. People who have greatly valued autonomy are more likely to suffer drops in self-esteem and to become agitated and hostile when forced to become dependent on others for services. Environmental factors such as degree of social support and the extent to which significant aspects of personal activities are disrupted will also affect well-being. Whether the experience, type, or number of adverse life events associated with early- and late-onset anxiety differs is as yet unknown. Moreover, whether cognitive/personality styles are differentially associated with negative events in older people and can thus account for a distinction in onset of late-life anxiety disorders has not been investigated to date.

4.5.1 Summary

The variables outlined above have been associated with the development of anxiety in late-life, and preliminary findings regarding an onset distinction indicate that some of these variables are differentially associated with anxiety according to age at onset. The extent of this knowledge is limited however and to date, there are no studies that have investigated the role of life stressors and psychological vulnerabilities in an age of onset distinction in late-life GAD. Drawing on the cognitive model proposed (see section 4.2), Boyd et al. (2000) suggest that the roles of psychological vulnerabilities and stressful life events might be differently weighted in early- and late-onset depression, but that the diathesis-stress interaction may be significant in both cases (presented diagrammatically in Figure 1, Section 5.2) (Boyd, et al., 2000). Given that anxiety and depression are closely related disorders in late-life, the same may be true of early- and late-onset GAD. As such, further research is required to clarify the theorised relationships between both early- and late-onset GAD in late life and the various psychological vulnerabilities and stress-related factors thought to account for an onset distinction.

4.6 Conclusions

The research reviewed in the previous chapters indicates that age at onset of anxiety amongst older adults is clearly an important concept for investigation. Research concerning early- and late-onset of anxiety demonstrates that age at onset is able to account, in part, for

the variation in the clinical experience of late life anxiety, in addition to treatment outcome. The theory and past research suggests that older adults with an early-onset and thus long history of anxiety are more likely to experience greater psychiatric comorbidity, have a family history of anxiety, and have greater clinical severity of anxiety symptoms. On the other hand, older adults with onset of anxiety for the first time in late life (LO) are reported to experience less clinical severity of symptoms, and greater experiences of life stress, such as physical and/or medical illness, and traumatic events leading up to the onset of anxiety. Although research has gone some way to explaining the variations in the aetiology, phenomenology and treatment outcome of early- and late-onset anxiety in older persons, further research is needed to clarify a number of issues (see Chapter Three). Given that much of the current knowledge regarding such differences is the result of investigations in which samples of older adults are distinguished by onset retrospectively based on arbitrary thresholds selected by the researcher, research is needed determine whether there exists two subgroups of older adults with EO and LO anxiety using a reliable assessment of age at onset. Furthermore, research is needed to identify a method for determining a cut-off to distinguish these subgroups in order to gain information regarding the age at which LO anxiety is likely to develop.

In addition, research is needed to investigate the relationship between age at onset and both the aetiological and phenomenological correlates of EO and LO anxiety in order to clarify the variables considered to be important in classifying these two subgroups. Clarification of these variables may therefore assist in identifying factors that might be addressed in early intervention and prevention programs for anxiety. It is also necessary to clarify the theorised relationship between the experience of negative life events and age at onset of anxiety. Despite reference to such a relationship in diathesis-stress models put forth to account for a distinction in the onset of depression (Boyd et al., 2000), little empirical evidence has been conducted to date, and no such model has been put forth to account for a distinction in early- and late-onset anxiety disorders.

SECTION II:

AN INVESTIGATION OF A BIMODAL DISTRIBUTION OF AGE AT ONSET FOR GAD AND THE RELATIONSHIP BETWEEN AGE AT ONSET AND THE AETIOLOGY AND PHENOMENOLOGY OF LATE-LIFE GAD

CHAPTER FIVE

Aims, Research Questions and Hypotheses

5.1 Aims and General Overview of the Research Questions

The aim of the empirical research presented in subsequent chapters of this thesis is to provide an original extension of the previous literature, for the purpose of understanding the role of age at onset in the clinical experience and management of GAD in late-life. An understanding of the potential differences in the experience of late-life GAD according to age at onset of psychopathology is long overdue. Past literature indicates that GAD can manifest in older adults for the first time in late life, without a prior history of psychopathology, and that the experience of anxiety symptoms may vary amongst older adults. Despite this, research has yet to comprehensively address this issue. The research reported in subsequent chapters of this thesis thus provides some hope of a better, empirically driven understanding of the experience and treatment implications of EO and LO GAD. The primary aim of this section of the thesis is to examine the following research questions:

Research Question 1: Is there an empirically identifiable cut-off age that differentiates EO GAD from LO GAD?

Research Question 2: What are the aetiological differences between older adults with early- and late-onset GAD?

Research Question 3: What are the phenomenological differences between older adults with early- and late-onset GAD?

Research Question 4: What are the differences between older adults with early- and late-onset GAD in the frequency and severity of stressful negative life events preceding the onset of anxiety?

Research Question 5: What is the relationship between the experience of negative life events across the lifespan and symptoms of psychopathology in late-life GAD?

Drawing on previous literature summarised in chapter Three, the intensive nature of the present study allows for the exploration of several specific relationships which stem from these six broader research questions. These research questions and the hypotheses pertaining to each of these questions are outlined in further detail in the following subsections.

5.2 Research Questions and Hypotheses

5.2.1 Research Question 1: Is there an empirically identifiable cut-off age that differentiates EO GAD from LO GAD? (Chapter Seven)

Chapter Seven examines whether the existence of two subpopulations of anxious treatment-seeking older adults; one with an onset earlier in life (EO) and the other with an onset occurring in late-life (LO), can be empirically established. Furthermore, Chapter Seven explores whether it is possible to empirically identify a cut-off point for best deciding to which subpopulation a given age of onset belongs. If the age of onset for anxious treatment-seeking older adults demonstrates a bimodal distribution, this would provide evidence of the existence of two subpopulations. As the thesis proposes that anxiety in older adults can be differentiated according to age of onset, it was hypothesised that:

Hypothesis 1: There would be a bimodal distribution for age at onset of late-life GAD.

If age at onset of late-life GAD does demonstrate a bimodal distribution, then it will be possible to empirically identify an age of onset cut-off point based upon the local minima in the probability density function.

5.2. 2 Research Question 2: What are the aetiological differences between older adults with early- and late-onset GAD? (Chapter Eight)

Chapter Eight presents the findings of an investigation aimed at examining aetiological differences between EO and LO GAD. A sample of older adults with EO and LO GAD were compared in a cross-sectional analysis across a number of aetiological factors. In particular, a series of between-groups comparisons were performed on participants' demographic and health characteristics. These health characteristics included indices of

chronic disease in later life, the use of prescription/non-prescription medication, treatment history and genetic risk factors. The proposed hypotheses relating to the associations between age of onset and these aetiological factors are outlined in Table 5.1. The following relationships are specifically addressed in Chapter Eight:

1. The association between age at onset of GAD and demographic characteristics such as gender, socioeconomic status, and level of education. A number of empirical studies reviewed in Chapter Three (Beck et al., 1996; Le Roux et al., 2005; Lenze et al., 2005) concluded that the demographic characteristics of late-life GAD is not distinguished by age at onset. Accordingly, it was hypothesised that early-and late-onset participants would be similar with respect to their demographic characteristics.

2. The relationship between age at onset of GAD and indices of chronic disease in later life. The literature pertaining to GAD reviewed in Chapter Three (Chou, 2009; Le Roux, et al., 2005) concluded that age of onset does not seem to be a significant factor with regard to medical comorbidity in late-life. On the other hand, studies of PD (Hassan & Pollard, 1994; Raj, et al., 1993) indicate that LO PD is associated with greater medical comorbidity than EO PD. A goal of this chapter, therefore, was to clarify whether there is a significant relationship between age at onset and the health characteristics of older adults with late-life GAD. Drawing upon previous research that has directly explored this relationship it was hypothesised that EO and LO groups would be similar with regards to medical comorbidity, in particular, in the frequency of specific health conditions reported and in the total number of medical conditions overall.

3. The relationship between age at onset of GAD and the current use of prescription and non-prescription medication. The literature reviewed in Chapter Three (Le Roux, et al., 2005) suggests that patients with EO GAD use psychotropic medication at significantly higher rates than those with LO GAD. It was therefore hypothesised that EO participants would use psychotropic medications (i.e. antidepressants and/or benzodiazepines) at a higher rate than LO participants. The use of prescription and non-prescription medication as well as alcohol use has not previously been examined in

investigations of age at onset of GAD. An aim of this chapter therefore was to explore the relationships between age at onset and both medication use and the use of alcohol. In light of previous findings of similarity in the medical comorbidity of EO and LO GAD, it was hypothesised that onset groups would be similar with regards to prescription and non-prescription medication use. Previous research suggests that amongst individuals with longstanding mental illness, alcohol and substance use are common comorbid conditions (Merikangas, et al., 1998) . Accordingly, it was hypothesised that EO GAD would be associated with greater alcohol use than LO GAD.

4. The relationship between age at onset of GAD and participants' treatment history, including help-seeking behaviour and history of treatment sought. The literature review (Le Roux, et al., 2005) suggested that EO GAD is associated with higher rates of past treatment utilisation (past psychotropic medication use and a history of counselling and/or psychotherapy) than LO GAD. Age at which older adults first sought help for a psychiatric illness has not specifically been investigated and was included for the purpose of exploring other aspects of help-seeking. It was hypothesised that EO participants would have a significantly younger mean age at help-seeking than LO participants. Specific hypotheses regarding the relationship between age at onset of GAD and treatment history to be examined in Chapter Eight are set out in Table 5.1 (see hypotheses 5a - 5d).

5. The relationship between early- and late age at onset of GAD and genetic factors. The relationship between age at onset of GAD and a family history of anxiety disorders has not previously been investigated. Based upon the PD literature reviewed (Battaglia, et al., 1998; Battaglia, et al., 1995; Goldstein, et al., 1997; Segui, et al., 1999; Sheikh, et al., 2004), however, it was hypothesised that a family history of mood and/or affective disorder would be more common in the relatives of older adults with EO GAD.

Table 5.1

Summary of Hypotheses Examined in the Investigation of Aetiological Differences between EO and LO GAD

Hypotheses 2 – 6: Chapter Eight
Age of onset and demographics
Hypothesis 2: EO and LO participants will be similar with respect to their demographic characteristics.
Age of onset and chronic disease in later life
Hypothesis 3: EO and LO groups will be similar with regards to medical comorbidity as indicated by the frequency of specific conditions reported and in the total number of medical conditions reported.
Age of onset and the use of prescription and non-prescription medication
Hypothesis 4a: EO participants will use psychotropic medications (i.e. antidepressants and/or benzodiazepines) at a higher rate than LO participants.
Hypothesis 4b: EO participants will not differ in the use of other prescription and non-prescription medications from LO participants.
Hypothesis 4c: EO participants will have higher rates of alcohol use than LO participants.
Age of onset and treatment history
Hypothesis 5a: EO participants will have a significantly younger mean age at help-seeking than LO participants.
Hypothesis 5b: EO participants will have more anxiety episodes than LO participants.
Hypothesis 5c: EO participants will have a longer history of anxiety as reflected in a greater period of time since onset of the first episode of GAD than LO participants.
Hypothesis 5d: Older adults with EO GAD will have a history of greater psychotropic medication use and history of psychotherapy and/or counselling at higher rates than those with LO of GAD.
Age of onset and genetic or predisposing factors
Hypothesis 6: A family history of mood and/or affective disorder will be more common among the relatives of older adults with EO GAD than those with LO GAD.

5.2.3 *Research Question 3: What are the phenomenological differences between older adults with early- and late-onset GAD? (Chapter Nine)*

Chapter Nine presents the findings of a study aimed at exploring differences between early- and late-onset groups across a number of phenomenological factors. In particular, a series of between-groups comparisons were performed in order to investigate differences between onset groups in rates of psychiatric comorbidity, indices of GAD-related symptom severity, including responses to psychometric measures of pathology, and on measures of health and functioning. The proposed hypotheses regarding the relationship between age of onset and these phenomenological factors are outlined in Table 5.2. The following relationships are specifically addressed in this Chapter Nine:

1. The relationship between age at onset of GAD and psychiatric comorbidity. The literature reviewed in Chapter Three (Chou, 2009; Le Roux, et al., 2005) suggests that EO GAD is associated with greater psychiatric comorbidity. It was therefore predicted that the EO group would have higher rates of psychiatric comorbidity than the LO group.

   The relationship between age at onset of GAD and indices of GAD phenomenology. These included the frequency and severity of GAD- related worries, the frequency acnd severity of GAD- related symptoms, interference and distress associated with worry, percentage of time spent worrying, interviewer-rated severity of GAD and responses on self-report measures of psychopathology. Interference, distress and percentage of time spent worrying have not previously been examined as indices of GAD severity. As such, an aim of this chapter was to explore the relationship between age at onset of GAD and these aspects of phenomenology. With the exception of interviewer-rated severity of GAD, which has been found to be greater amongst those with EO GAD (Beck, et al., 1996; Le Roux, et al., 2005), drawing on previous literature suggesting that early- and late-onset anxiety disorders are not differentiated phenomenologically (Beck, et al., 1996; Hoehn-Saric, et al., 1993; Raj, et al., 1993; Sheikh, et al., 2004), it was hypothesised that onset groups would be similar with regard to these variables (see hypotheses 8a - 8e).

2. The relationship between early-and late-onset GAD and measures of health and functioning, including self-perceived health and functional limitations. Measures of health and functioning have previously been examined as indices of the severity of psychopathology, and are thought to be differentially associated with disorders of late-life. In line with recent findings of self-perceived health (Chou, 2009) and previous literature suggesting that onset of anxiety later in life may be associated with negative health-related changes (Lindesay, 1991b), it was hypothesised that LO participants would have poorer perception of their own health as compared to participants with EO of GAD (see hypothesis 9a). With regard to functional limitations, the literature suggests that LO GAD is associated with greater functional limitations than EO GAD (Chou, 2009; Le Roux, et al., 2005). Therefore, it was predicted that older adults with LO GAD would report greater functional limitations than participants with EO GAD (hypothesis 9b).

Table 5.2

Summary of Hypotheses Examined in the Investigation of Phenomenological Differences between EO and LO GAD

Hypothesis 7: Chapter Nine
Age of onset and psychiatric comorbidity
Hypothesis 7a: EO participants will have higher rates of psychiatric comorbidity than LO participants at time of evaluation (i.e. the presenting disorder).
Hypothesis 7b: EO participants will have higher rates of psychiatric comorbidity than those with LO GAD at onset of first DSM-IV disorder of any kind.
Hypothesis 7c: EO participants will have higher rates of psychiatric comorbidity than those with LO GAD at onset of first DSM-IV anxiety disorder.

Table 5.2 - continued

Summary of Hypotheses Examined in the Investigation of Phenomenological Differences between EO and LO GAD

Hypotheses 8 – 9: Chapter Nine
Age of onset and indices of GAD phenomenology
Hypothesis 8a: EO and LO participants will be similar with regard to the frequency and severity of GAD -related worries.
Hypothesis 8b: EO and LO participants will be similar with regard to the frequency and severity of GAD symptoms.
Hypothesis 8c: EO and LO participants will be similar in the experience of interference, distress and percentage of time spent worrying daily as a result of GAD symptoms.
Hypothesis 8d: EO participants will have significantly higher interviewer-rated GAD severity than those with LO GAD.
Hypothesis 8e: EO and LO participants will be similar with regards to symptoms of pathology as assessed by self-report measures of depression, anxiety, worry, trait anxiety, anxiety sensitivity, self efficacy and locus of control.
Age of onset and measures of health and functioning
Hypothesis 9a: Participants with LO GAD will have poorer perceptions of their health compared to participants with EO of GAD.
Hypothesis 9b: Older adults with LO GAD will have greater functional limitations than those with EO GAD.

5.2.4 Research Question 4: What are the differences between older adults with early- and late-onset GAD in the frequency and severity of stressful negative life events preceding the onset of psychopathology? (Chapter Ten)

Drawing on the cognitive model proposed in Chapter Four (see section 4.2), Boyd et al. (2000) suggest that the roles of both cognitive vulnerabilities and stress (negative events) might be differentially weighted in early-and late-onset depression, but that the diathesis-stress interaction may be significant in both cases. Given that anxiety and depression are closely related disorders in late-life, the same may be true of early-and late-onset anxiety. Accordingly, consideration of this stress-diathesis model in accounting for an onset

distinction in late-life GAD may be important in further understanding this distinction. Available data support the proposition that LO GAD is associated with greater levels of life stress. For example, in the ECA data, the occurrence of one or more negative events has been noted to increase the risk of developing GAD by threefold in the 12-month period following negative life events (Blazer, et al., 1987). In line with this, increased incidence of GAD has been reported in the 20 months following a catastrophic financial loss in a sample of older adults (Ganzini, McFarland, & Cutler, 1990). Thus, although there is some evidence that environmental precipitants may play a more important role in LO GAD than in EO GAD among older adults, further investigation is needed to confirm these findings. Research question 4 is therefore specifically aimed at investigating the relationship between age at onset of GAD and stressful life events preceding the onset of the presenting episode of GAD and past episodes of clinically significant anxiety disorders. The hypotheses put forward to examine this relationship (hypotheses 10a – 10e) are outlined in Table 5.3 and are addressed in Chapter Ten.

Table 5.3

Summary of Hypotheses Examined in the Investigation of the Relationship between Age at Onset and Stressful Life Events Preceding the Onset of Psychopathology

Hypotheses 10a – 10e: Chapter Ten
Hypothesis 10a: LO participants will experience higher rates of health-related events preceding the onset of the presenting episode of GAD.
Hypothesis 10b: LO participants will experience health-related events of greater severity preceding the onset of the presenting episode of GAD.
Hypothesis 10c: LO anxiety will be associated with a higher frequency of stressful life events preceding first onset of a DSM-IV anxiety disorder of any kind.
Hypothesis 10d: LO anxiety will be associated with life events of greater severity preceding first onset of a DSM-IV anxiety disorder of any kind than EO anxiety.
Hypothesis 10e: LO participants will experience a greater number of negative/stressful life events preceding the onset of each episode than EO participants.

5.2.5 Research Question 5: What is the relationship between the experience of negative life events across the lifespan and symptoms of psychopathology in late-life amongst those with EO and LO GAD? (Chapter Ten)

In the depression literature, research has found catastrophic events experienced early in childhood and early life experiences during WWII to be associated with depression in later life (Beekman et al., 1995). In addition, negative socio-economic circumstances during childhood and adulthood, severe illness of significant others and negative experiences of relationships in adulthood appear to be related to depressive symptoms in late life (Kraaij, Kremers, & Arensman, 1997). In studies of young and middle-aged adults, the experience of physical, sexual and emotional abuse are found to have a significant and long lasting impact on emotional wellbeing (Beitchman et al., 1992; Bifulco, Harris, & Brown, 1992; Brown & Harris, 1993). Despite these preliminary findings in the depression literature, there is little knowledge about negative events experienced early in the life of older adults. Kraaij and de Wilde (2001) note that this is all the more surprising given that older people constitute the age group with the highest possible accumulation of negative life events. Similarly, not only is there a paucity of research investigating the relationship between negative events and anxiety in later life, but also of the relationship between current anxiety, specifically GAD, in older adults and negative life events experienced across the lifespan. Consequently, whether the experience, type, or number of adverse life events associated with early- and late-onset GAD differs is as yet unknown. The literature reviewed in Chapter Four and summarised above highlights the need for investigation of the negative stress-related factors (life events) associated with EO and LO GAD.

Research Question 5 therefore aimed to investigate the relationship between the experience of negative life events across the lifespan and symptoms of psychopathology in later life, with respect to an age of onset distinction. Due to a lack of previous research regarding this relationship, a number of specific exploratory research questions were put forward to further examine this broader research question in detail. Using a measure of negative life events, a series of between-groups comparisons and examination of correlation coefficients were performed to examine these questions. The research questions explored in Chapter Ten are listed in Table 5.4.

Table 5.4

Summary of the Exploratory Research Questions Examined in the Investigation of the Relationship between Age at Onset of GAD and the Experience of Negative Life Events across the Lifespan

Exploratory research questions 1 - 6: Chapter Ten
Exploratory Research Question 1: What is the prevalence of negative life events experienced by EO and LO participants at different developmental periods across the lifespan.
Exploratory Research Question 2: What is the relationship between the total number of negative life events of each type experienced throughout life and symptoms of psychopathology in later life amongst participants with EO and LO GAD.
Exploratory Research Question 3: What is the relationship between the experience of specific negative life events during each developmental period and symptoms of psychopathology in later life amongst participants with EO and LO GAD.
Exploratory Research Question 4: What is the relationship between the total number of negative life events of all types experienced per developmental period and symptoms of psychopathology in late life.
Exploratory Research Question 5: Are there differences between onset groups in the mean number of specific negative life events experienced per developmental period and throughout life.
Exploratory Research Question 6: Are there differences between onset groups in the mean number of total life events experienced per developmental period and throughout life.

5.3 Theoretical and Clinical Implications

This investigation is one of the first of its kind in the area of age at onset of GAD in late-life and will provide a number of crucial theoretical and practical implications. In terms of the theoretical benefits, the study will outline an empirical method for identifying the existence of two subgroups of older adults with early-and late-onset GAD and determine a cut-off point for best deciding to which subpopulation a given age of onset belongs. Such a method may then be used in future onset research, rather than the selection of arbitrary cut-offs chosen by the investigator, as has been done in the past. The present study will further aim to reveal fundamental information about the aetiology and phenomenology of early- and late-onset GAD. Aetiological and phenomenological variables will be examined in a moderately large clinical sample, a subsample of which undergoes CBT for GAD and long-term follow-up. The hypothesised relationships between age of onset and aetiological factors such as demographic characteristics, indices of chronic disease and medical comorbidity and genetic factors, in addition to phenomenological factors such as symptom frequency and severity, psychiatric comorbidity, disability, distress, interference and symptoms of psychopathology will be explored. This will in turn serve to enhance our understanding of the aetiology and phenomenology of EO and LO GAD in older adults and the nature of the theory of a distinction in early- and late-onset GAD in late-life.

The current study also examines the relationship between age at onset of GAD and the experience of negative life events preceding episode onset. By investigating the role of the stress-diathesis interaction in the onset of GAD, this study will provide a greater understanding of the environmental precipitants to the onset of GAD, which will help to inform early-intervention and the treatment of late-life GAD. Furthermore, the current study examines the relationship between negative life events in key developmental periods across the lifespan and symptoms of anxiety, worry and depression in the context of an onset distinction in late-life GAD. Evidence of meaningful patterns regarding this relationship may inform future research in this area.

CHAPTER SIX

Method

6.1 Participants

Participants included individuals aged 55 and over who were seeking help for symptoms of anxiety and worry. Although definitions of old age commonly use an age of 65 as a starting point, previous investigations of anxiety in older adults have utilized participants aged 55 and over (McCabe, et al., 2006; Wetherell, Gatz, & Pedersen, 2001). The lower age cut-off of 55, as opposed to the commonly used sample of 65 and over (Flint, 1994; Mohlman et al., 2004; Stanley, Beck, et al., 2003; Stanley, Hopko, et al., 2003), was used here in order to provide access to a wider pool of potential participants. This cut-off further allowed for the inclusion of interested participants between the ages of 55-64 who identified themselves as 'older adults' and otherwise identified with inclusion criteria.

Eligible participants had a principal or co-principal diagnosis of GAD as established by the Anxiety Disorders Interview Schedule for DSM-IV- Lifetime version (ADIS-IV-L: DiNardo, Brown, & Barlow, 1994). Exclusion criteria included age under 55; a history of mania or psychosis; cognitive impairment as indicated by a score of less than 83 on the Addenbrooke's Cognitive Exam (ACE: Mathuranath, Nestor, Berrios, Rakowicz, & Hodges, 2000) (see Appendix A) or a reported diagnosis of dementia; current participation in psychotherapy; current alcohol or other substance abuse, and; commencement of psychotropic medication within two months of commencement of the study. Individuals with comorbid depression, dysthymia, or other anxiety disorders were not excluded from participation. Individuals currently stabilised on psychotropic medication for at least two months were included, though were asked to refrain from changing their dose or type of medication for the duration of the study.

To recruit participants, a media release was written and released through the ANU Media Office (Appendix B). Following its release the study was advertised in both the state paper and a local community newspaper in Canberra, on a local ABC radio station on the AM band, and via the Australian National University (ANU) Psychology Clinic, where clients are able to self refer for the treatment of anxiety and depression. A flyer describing the study was also distributed among Canberra community services specific

to older adults (Appendix C). These services included the Council of the Ageing (COTA), the Belconnen and Hughes Senior's Centre's, and the ACT Health Promotion Website. Interested volunteers were asked to contact the primary investigator with their contact details. Volunteers were subsequently contacted by telephone by the investigator to discuss the aim and nature of the study. Following a brief initial telephone screening to assess suitability for the study, potential participants were invited to attend the Australian National University for comprehensive clinical assessment interviews with the primary investigator.

From an original response of 119 community-dwelling individuals residing in the Australian Capital Territory (ACT), 96 (81%) volunteered to participate in this study. Of the 96 participants initially recruited, all completed the clinical interview. Of those participants, 76 met the diagnostic criteria for a current DSM-IV anxiety disorder. A further nine participants reported significant past episodes of anxiety but did not meet the diagnostic criteria for a current anxiety disorder at evaluation. Eleven individuals without psychiatric disturbance who volunteered were not included in the current investigation. The 85 older adults meeting diagnostic criteria for either a current or past episode of anxiety were included in the investigation of a bimodal distinction of age at onset (Chapter Seven) and included 27 males (31.8%) and 58 females (68.2%). Participants were aged between 55 and 85 years of age, with a mean age of 64.67 for males ($SD = 7.43$) and 63.21 for females ($SD = 6.24$).

The nine participants reporting significant past episodes of anxiety who did not meet diagnostic criteria for a current anxiety disorder were excluded from subsequent investigations. The remaining 76 participants included in the investigations presented in Chapters Eight through Ten were 22 males (29%) and 54 females (71%). Of these 76 participants, seven were unable to return for a second appointment to complete the Negative Life Events Questionnaire interview due to factors such as caring for a terminally ill partner, work commitments, moving interstate and overseas travel. The 69 older adults included in investigation of the relationship between negative life events across the lifespan and late-life GAD included twenty-two males (31.9%) and forty-seven females (68.1%). The mean age of males included in this investigation was 63.91 ($SD = 6.62$) and 62.76 for females ($SD = 6.39$). A flowchart depicting participant inclusion in the current investigation is presented in Figure 6.1.

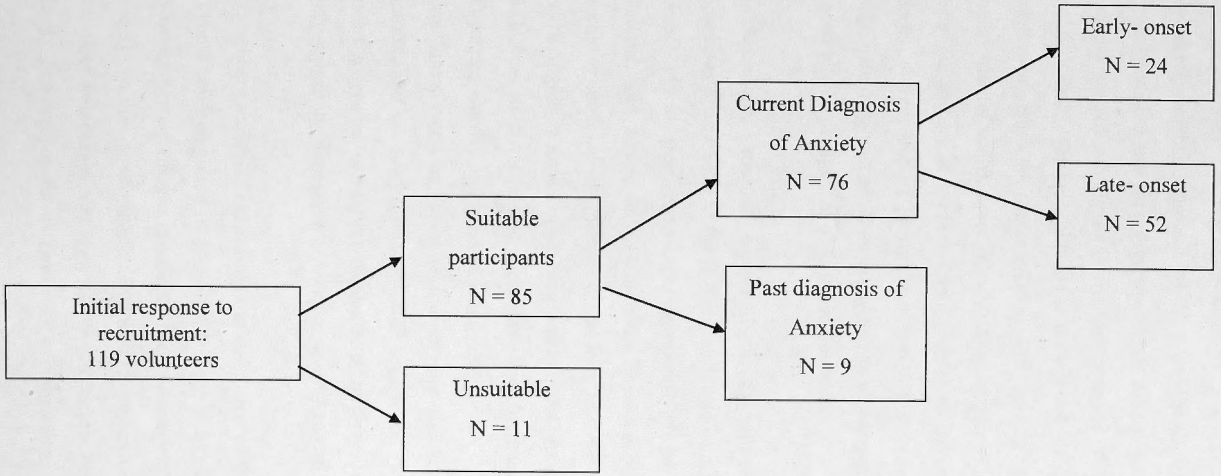


Figure 6.1. Flowchart of participants recruited to Study One

6.2 Design

The studies presented in chapters Seven through Ten were of a cross-sectional, observational design. Since age at onset defined the groups to be compared, belonging to the "early-onset" (EO) or "late-onset" (LO) group represented the between subjects independent variable. Age and gender were not included as covariates, as descriptive analyses revealed that onset groups were similar in terms of age and gender. The dependent variables analysed in the investigation of the aetiological correlates of EO and LO GAD (Chapter Eight) were age of onset characteristics, demographic characteristics, health characteristics and genetic factors. Demographic variables included marital status, level of education, employment status, employment intensity, occupation, and social support. Health variables included number and type of chronic illnesses, current use of prescription and non-prescription medication and treatment history, including past psychotherapy and psychotropic medication use. Genetic factors included a family history of psychiatric illness.

The dependent variables examined in the investigation of phenomenological comparisons of EO and LO GAD (Chapter Nine) were psychiatric comorbidity, indices of GAD-related phenomenology, measures of perceived health and functional limitations, and scores on psychometric measures of psychopathology. Psychiatric comorbidity included diagnostic comorbidity at time of evaluation, at first onset of a DSM-IV anxiety disorder of any kind, and at first onset of a DSM-IV-L disorder of any kind. Indices of GAD-related phenomenology included the frequency and severity of GAD-related worries, the frequency and severity of GAD-related symptoms, percentage of time spent worrying, level of interference and distress experienced due to GAD symptoms, and overall interviewer-rated severity of GAD. Psychopathology variables included scores on self-report measures of anxiety, worry, depression, trait anxiety, anxiety sensitivity, a measure of locus of control and on a measure of self-efficacy.

The dependent variables examined in investigation of the relationship between negative life events and symptoms of psychopathology in EO and LO late-life GAD (Chapter Ten) were negative life circumstances preceding episode onset, negative life events as measured by the negative Life Events Questionnaire, and scores on psychometric measures of pathology. Negative life circumstances preceding episode onset included difficulty and/or changes in family or relationships, in occupation or education, in

financial circumstances, in health, and in 'other' life events. Negative life event clusters included death of significant others, significant illness (personal and in significant others), socio-economic circumstances, abuse (sexual, physical and emotional), crime/disaster/war events (CDW), negative relationships with others and problem behaviours of significant others. Measures of psychopathology included all those examined in chapter Nine, listed above.

6.3 Materials

6.3.1 The Addenbrooke's Cognitive Examination

The Addenbrooke's Cognitive Examination (ACE: Mathuranath, et al., 2000) was used as a screening tool to examine the suitability of interested candidates for the study. The ACE is considered a reliable and valid instrument for the assessment of cognitive functioning. The ACE assesses cognitive status (Appendix A) by evaluating six separate cognitive domains (orientation, attention and concentration, memory, verbal fluency, language, and visuospatial abilities). The ACE surveys these key aspects of cognition without the use of specialised equipment. The ACE is administered by the investigator and is scored out of 100. The ACE is a bed-side or clinic-based schedule that incorporates the Mini-Mental State Examination (MMSE), though expands on its assessment of memory, language and visuospatial components, as well as adding tests of verbal fluency. The MMSE is the most widely used and validated bedside instrument for mental status evaluation, but has certain limitations. These include insensitivity to early stages of Alzheimer's disease and to isolated frontal or linguistic deficits found in early Fronto-Temporal Dementia. The ACE has high internal consistency (78%) (ACE: Mathuranath, et al., 2000), indicating that all its component scores contribute to the measurement of cognitive functions and correlate well with the composite score. At a cut-off of 88, the ACE offers a high sensitivity of 93%, and a specificity of 71% for identifying dementia. The lower cut-off score of 83, which is recommended as more appropriate for research studies requiring a high specificity or when screening populations with a low base rate of dementia, has a sensitivity of 82% and a specificity of 96%. Participants with an ACE score ≤ 83 were excluded from participating in the study.

6.3.2 Psychiatric diagnoses, psychiatric comorbidity and age at onset of psychiatric illness

Because of the importance of identifying age at onset of current and lifetime disorders in the present study, the Anxiety Disorders Interview Schedule for DSM-IV Lifetime version (ADIS-IV-L: DiNardo, et al., 1994) was used to assess psychiatric diagnoses and age at onset. The ADIS-IV-L is a semi-structured clinical interview administered by the investigator and provides an in-depth, full diagnostic assessment of a broad range of conditions (e.g., anxiety disorders, mood disorders, somatoform disorders, and substance use disorders), as well as permitting differential diagnosis amongst these disorders according to DSM-IV criteria. The Interview Schedule is designed to determine the onset and precipitants to current and past episodes of these conditions, using a diagnostic timeline that fosters accurate determination of the onset, remission and temporal sequence of these conditions (Grisham, Brown, & Campbell, 2004). The review of lifetime data allows the investigator to determine if and when a client had previously been diagnosed with a DSM-IV disorder, and to assess major clinical dimensions of past episodes of psychopathology. If participants are vague as to the date of onset, the interviewer is prompted to ascertain the time period by asking questions that link onset to objective life events (e.g., "can you recall anything that might have led to this problem," and "what was happening in your life at the time?"). A series of questions are asked to establish the level of interference and distress associated with symptoms of each given disorder, to rule out medication side effects and medical conditions as causes for the symptoms, and to clarify the life circumstances that were present at the onset of symptoms (Antony & Barlow, 2002). The detailed inquiry into key symptoms, inclusion of items fostering differential diagnosis with neighbouring conditions, inquiry on precipitants and life stressors at time of disorder onset, as well as reasons for remission, exceeds that found in other popular instruments such as the Structured Clinical Interview for DSM-IV (SCID: First, Spitzer, Gibbon, & Williams, 1997).

As part of the interview, the clinician (investigator) assigns a 0-8 clinical severity rating (CSR) to indicate the degree of distress and interference in functioning associated with each current and lifetime diagnosis. In instances where the participants met criteria for two or more current diagnoses, the principal diagnosis was the one receiving the highest CSR. In instances where an individual presented with two distinct emotional disorders

of equal severity, co-principal diagnoses were given. As such, assessment of psychiatric comorbidity was conducted at the dimensional level where symptoms were evaluated on a continuum, rather than imposing DSM hierarchical rules. Psychiatric comorbidity thus described whether a participant had at least one co-principal DSM-IV diagnosis at evaluation, at first onset of a DSM-V disorder of any kind and at first onset of a DSM-IV anxiety disorder of any kind, and consisted of two categories; yes and no.

6.3.3 JNC Digital Concepts Digital Recorder (USB 350)

Assessment and diagnostic interviews were recorded using a JNC digital recorder USB-350. Given the complexity and depth of interviews, recordings allowed for a review of all interviews to ensure that all the relevant details were documented. Recordings also provided an independent rater with audio of the interviews, for inter-rater reliability of the principal diagnosis and of age at onset.

6.3.4 Demographic characteristics

Demographic characteristics were collected during participants' initial assessment interview using both the ADIS-IV-L (DiNardo, et al., 1994), and a semi-structured interview schedule constructed to obtain detailed information about the participants' personal history. This included details about their upbringing, relationship with parents and siblings, marital/relationship history and family constellation, and familial psychiatric history. The interview schedule also asked questions about educational and vocational history, and social networks (See Appendix D for a copy of the complete interview schedule). Demographic characteristics collected included gender, marital status, cultural/ethnic background, religious background, level of education, employment status, employment intensity, occupation, and social demographics.

Marital status consisted of four categories; single/never married, married or cohabiting (de facto), separated or divorced, and widowed. Level of education indicated the highest level of education attained. Education consisted of seven categories; primary school, high school for less than 4 years, graduated from high school, completed some technical training or university education, undergraduate degree, completed some post-graduate education, and postgraduate qualifications. Employment status described whether the participants were currently employed with three categories; employed, unemployed, and

retired. Employment intensity described the amount of hours spent in employment, and consisted of two categories; part-time and full time. Occupation consisted of eleven categories; medical profession, scientific background, academic profession, military profession, tradespersons, labourers and related workers, clerical and service workers, intermediate and elementary workers in production and transport, clerical positions, sales and marketing, and 'other', which included positions such as sewing and dressmaking, and homemaking. Social support items were assessed using the semi-structured interview schedule constructed for the present study, and consisted of questions about the receipt of social support from participants' friends, children, and partner. Quality of social contact from friendship networks consisted of two categories, acquaintances only and confiding relationships.

6.3.5 Health characteristics

Information on chronic health conditions was collected during the initial assessment interview, using the semi-structured interview schedule as previously described (Appendix D). The schedule comprised of a section assessing health-related characteristics of participants including their current medical/physical conditions and asked questions regarding current medication use, including use of recreational substances. Participants were also asked questions about past treatment, as well as questions to ascertain self-perceived health and self-reported limitations in activity due to current physical health. Medical conditions assessed included diseases of the nervous system, cardiovascular conditions, respiratory disease, neoplasms, endocrine conditions, cholesterol, digestive and gastro-intestinal conditions, genitourinary conditions, ear/eye conditions (problems with perception), ear, nose and throat conditions, pain syndrome, and musculoskeletal/connective tissue conditions.

Medications taken by participants were categorised as prescription or non-prescription. Prescription medications included antidepressants, anxiolytics (benzodiazepines), anti-hypertensives, anticoagulants, anticonvulsives, anti-inflammatory, sedatives, hypothyroid medication, hypolipidaemics, hypoglycaemic medications, and nicotinic analgesics. Non-prescription medications included anti-reflux agents, anti-diarrhoeal medications, simple analgesics, vitamins, minerals, and fish oil. The use of medications

described whether the participant was regularly taking this medication throughout participation in the study and consisted of two categories; yes and no.

Information collected about participants' treatment history included the age at which participants first sought help for a psychiatric problem, measured in years, and the type of treatment sought or received. The type of treatment described whether the participant had sought or received psychotropic treatment, counselling and/or psychotherapy, or both psychotropic and psychotherapeutic treatment, and consisted of two categories; yes and no. Other variables assessed as part of treatment history included the number of episodes of psychiatric illness and duration of mental health history with respect to number of years since onset of first episode.

Functional limitations were assessed using one item which enquired as to whether participants' current health limited their ability to do any of a number of daily activities. These activities included; vigorous activities such as jogging or running, lifting heavy objects, or participating in sports; moderate activities such as pushing a vacuum cleaner, moving furniture or playing golf; light activities such as walking; climbing stairs; bending, kneeling or stooping; bathing or dressing oneself, and; other. Items were scored on a 3-point scale where 1 = not at all limited, 2 = limited a little, and 3 = limited a lot.

Self perceived health was assessed using a single item that has been used extensively in past research (Chipperfield, 1993; Idler & Kasl, 1991; Wolinsky & Johnson, 1992), and is reported to predict mortality beyond seemingly more "objective" health measures (Menec, Chipperfield, & Perry, 1999; Mossey & Shapiro, 1982). This item asked participants to rate their health considering their age on a 5-point scale where 1= excellent, and 5 = poor. A second item was included, asking participants how they would rate their current health compared to one year ago. This item was also rated on a 5-pont scale where 1 = much better than one year ago, and 5 = much worse than one year ago. Ratings for both items were subsequently reverse coded such that high scores reflected excellent health/better than one year ago, and low scores reflected poor health/ worse than one year ago.

6.3.6 Genetic factors

Information on the presence of current or past affective disorders, anxiety disorders, and other DSM-IV disorders in the relatives of participants was collected during the semi-structured assessment interview, as described above. A family history of psychiatric illness described whether the immediate family members of participants including their mother, father, and children currently have, or have had a diagnosis of a psychiatric disorder in the past. This variable consisted of two categories; yes and no.

6.3.7 Indices of GAD-related phenomenology

Indices of GAD-related phenomenology including the frequency and severity of GAD-related worries, as well as the frequency and severity of GAD-related symptoms were assessed using the ADIS-IV-L (Di Nardo, et al., 1994). The ADIS-IV-L, administered at the initial assessment interview by the principal investigator as previously described in section 6.3.2, elicits dimensional clinician ratings of the essential features of each disorder. Clinicians rate the excessiveness of each worry area on a scale from 0-8, where 0 = no worry/tension and 8 = constantly worried/extreme tension. The rating reflects a combination of the frequency, appropriateness, and tension associated with that worry sphere. In addition, the clinician makes a separate rating that reflects the person's ability to control the worry about that aspect of their lives, where 0 = no difficulty, and 8 = extreme difficulty. Symptoms are also rated dimensionally on a 0-8 scale, where 0 = none, and 8 = very severe. This allows for judgment of the degree to which an individual experiences symptoms like restlessness or irritability.

Participants were also asked to estimate the percentage of time spent worrying about their particular areas of worry, and a series of questions were asked to establish the level of interference and distress associated with GAD symptoms. The various dimensional ratings facilitate the assignment of an overall clinical severity rating (CSR) for the diagnosis. A scale of 0 to 8 is also used for this clinician rating (0 = none to 8 = very severely disturbing/disabling). In general, a CSR of 4 or higher is judged to reflect the presence of a clinical level of psychopathology, whereas a CSR of 3 or lower represents a subclinical disorder.

6.3.8 Anxiety

In addition to the assessment of anxiety symptoms using the ADIS-IV-L, anxiety symptoms were assessed using the Geriatric Anxiety Inventory (GAI: Pachana et al., 2007) (Appendix E). The GAI is a 20-item self-report inventory designed specifically to assess anxiety in older adults in a range of settings. Participants completed the GAI as part of a series of questionnaires provided at the initial interview, during treatment, and six-months following completion of CBT treatment. The inventory has a dichotomous response format (agree/disagree) for ease of use in the context of mild cognitive impairment or poor education. Relative to other inventories assessing anxiety, the GAI places less focus on somatic symptoms, so as to reduce overlap with the symptoms of general medical conditions. Responses to the 20-item scale are summed to yield an overall scale score, with higher scores indicating greater severity of anxiety symptoms.

All 20 items of the GAI have item-total correlations of 0.39 or above, with most above 0.50. The Cronbach's alpha coefficient of 0.91 for the 20-item inventory amongst normal older adults and 0.93 in a psychogeriatric sample suggests a high degree of internal consistency for the GAI. Test-retest reliability for a one-week period was reported as 0.91 and concurrent validity with a variety of other measures has been demonstrated in both the normal and psychogeriatric populations. In the development and testing of the GAI, Pachana et al. (2007) reported the optimum cut-off point in distinguishing geriatric patients with DSM-IV GAD from those without GAD to be 10/11, which correctly classified 83% of patients with a sensitivity of 75% and a specificity of 84%. A cut-off of 8/9 was reported to identify patients with any anxiety disorder, and was noted to correctly classify 78% of patients with a sensitivity of 73% and specificity of 80%. The GAI was considered to be the most appropriate and valid measure of assessing symptom severity across a range of anxiety disorders and symptoms in the present sample.

6.3.9 Worry

The Penn State Worry Questionnaire (PSWQ: Meyer, et al., 1990) is a 16-item self-report instrument used for the assessment of clinically significant pathological worry. The items of the PSWQ (Appendix F) provide a measurement of a person's tendency to engage in excessive worry, irrespective of the worry content, and associated ability to

control worry. The PSWQ was completed as part of a battery of questionnaires provided before, during, and six-months following completion of CBT treatment. Each item is rated on a 5-point scale from 1 = "not at all typical of me" to 5 = "very typical of me." Items are summed to obtain a total score out of 80 for the scale, with higher scores indicating a greater tendency to worry.

The PSWQ has been validated amongst a sample of mixed anxiety disorders ($\alpha = 0.93$) and GAD clients ($\alpha = 0.86$) (Brown, Antony, & Barlow, 1995) and has good internal consistency and adequate convergent validity in older adults with GAD, as well as in those without psychiatric diagnoses (Beck, Stanley, & Zebb, 1995; Stanley, Novy, Bourland, Beck, & Averill, 2001). In young adult samples, a cut-off score of 45 out of 80 has been reported to accurately identify GAD participants with 99% sensitivity and 98% specificity (Behar, Aclaine, Zuellig, & Borkovec, 2003). This cut-off is recommended when an investigator has advertised for individuals with worry-related problems, or when non-anxious/non-depressed individuals have had an initial screening. If screening for GAD participants from an unselected sample, a cut-off of 62 is recommended, and is reported to accurately identify non-cases of GAD from cases with 86% specificity and 98% negative predictive power. Molina and Borkovec (1994) reported on PSWQ means and standard deviations compiled from all existing data sets available within a two-year period after the PSWQ was available in its published form. Mean scores of between 63.24 ($SD = 9.33$) and 67.66 ($SD = 8.86$) were reported across a number of clinical samples diagnosed with GAD (Molina & Borkovec, 1994), and between 30.98 ($SD = 8.13$) and 44.27 ($SD = 11.44$) for non-anxious samples.

6.3.10 Depression

Depressive symptoms were measured using the Geriatric Depression Scale (GDS-15: Sheikh & Yesavage, 1986a), a 15 item self-report scale answered in a yes/no format, designed specifically to assess depression in older adults. The GDS-15 (Appendix G) was completed by participants as part of a battery of questionnaires provided at the initial assessment interview before treatment, during treatment, and six-months following completion of CBT treatment. The scale focuses on the unique cognitive complaints of older persons and places less emphasis on somatic symptoms than traditionally found in measures of depression, due to the high incidence of somatic complaints in non-depressed older adults. A cut-off of 6/7 correlates significantly with

that of the 30-item parent scale. In addition, the parent scale has been shown to correlate well with the number of research diagnostic criteria symptoms for depression. Sensitivity of the GDS-15 ranges from 79%-100% and specificity from 67%-80% (Friedman, Heisel, & Delavan, 2005; Kurlowicz & Greenberg, 2007). There is debate as to which cut off score gives the best specificity and sensitivity (i.e. 5 or 6), but 6 is recommended, as it is associated with higher sensitivity. The GDS-15 has been found to have a high degree of internal consistency, and higher than that of the Hamilton Rating Scale for Depression (HRS-D) and the Zung Self Rating Depression Scale (SDS: Yesavage et al., 1982-1983).

6.3.11 Trait anxiety

Trait anxiety was assessed using the Spielberger State-Trait Anxiety Inventory-Trait scale (STAI-T: Spielberger, et al., 1983). The STAI-T was completed as part of the initial assessment and again six months following completion of CBT treatment. The STAI-T is a 20-item self-report scale consisting of a number of statements used to describe oneself and provides a score indicating an individual's general tendency to be anxious. Eleven of the items enquire about negative characteristics (e.g., feeling "nervous," "inadequate," or "tense"), whilst nine are anxiety-absent positive items (e.g., "I feel calm"). Items are rated on a 4-point scale with the following categories: (1) 'Almost Never', (2) 'Sometimes', (3) 'Often', and (4) 'Almost always'. Individuals were asked to indicate how they 'generally' felt with regards to each statement. Scoring weights for the anxiety-absent items were reversed, such that responses marked 1, 2, 3, or 4 were scored 4, 3, 2, or 1 respectively, and weighted scores for the 20 items were summed to obtain a total score out of 80 for the scale. Higher scores indicate a greater tendency to be generally anxious.

Investigations of reliability have demonstrated high internal consistency of the STAI-T (Spielberger, et al., 1983), with the median Cronbach's alpha coefficient for the STAI-T across a range of participant samples reported as 0.90. Spielberger et al. also reported evidence of good construct validity, as did Stanley, Beck and Zebb (1996), who investigated the psychometric properties of the STAI in older adults with and without anxiety complaints. A cut-off of 39/40 on the sum score is recommended by Spielberger et al. Recent studies investigating the psychometric properties of the STAI-T in younger and older populations without a psychiatric diagnosis (Fuentes & Cox, 2000) reported

mean scores of 39.3 and 33.8 in older females and males respectively, and a mean of 38.9 in a younger adult population, consistent with Spielberger et al.'s original norms which ranged from 34.79 (*SD* = 9.22) to 40.40 (*SD* = 10.15) in samples of working adults, students, and military recruits. Investigation of the psychometric properties of the STAI-T in an older adult population (Stanley, Beck, & Zebb, 1996) found older adults meeting DSM-III-R criteria for GAD to have a mean of 48.0 (*SD* = 11.9).

6.3.12 Anxiety Sensitivity

Anxiety Sensitivity refers to the fear of anxiety symptoms, as they are believed to have harmful somatic, psychological, or social consequences, and was assessed using the Anxiety Sensitivity Index (ASI: Peterson & Reiss, 1987). The ASI is a 16-item self-report inventory which was included to provide information relevant to the diagnosis and treatment of people with anxiety disorders. The ASI was completed as part of a battery of questionnaires provided at the initial assessment interview and six-months post completion of the CBT treatment program. Examples of items include " It scares me when my heart beats rapidly" and " When my stomach is upset, I worry that I might be seriously ill." Each item of the ASI is scored on a 5-point scale with the categories of 'very little', 'A little', 'Some', 'Much', and 'Very much'. Individuals were asked to circle the category that best represents the extent to which they agree with the item. The ASI was scored by summing the points for all sixteen items, which was then used for comparison with the norms. The official norms were constructed from twelve studies, with the average total score for a non-clinical population reported as 19.01, and a standard deviation of 9.11. The mean score reported for a clinical population is 35.9, more than two standard deviations above the ASI norm, with mean scores reported for each anxiety condition varying between 0.5 and 1.0 standard deviation above the ASI norm. The mean score reported for GAD is 26.1.

A number of published studies investigating internal reliability (Peterson & Heilbronner, 1987; Reiss, Peterson, Gursky, & McNally, 1986; Taylor, Koch, & Crockett, 1991) have reported alpha coefficients in the range of 0.8 to 0.9, indicating a high degree of internal consistency for items on the ASI. Reiss et al., (1986) further reported a two-week test-retest reliability of 0.75, reported to be satisfactory for an anxiety measure, and Maller & Reiss (1992) reported a three-year test-retest correlation of 0.71, which has been interpreted as evidence that the ASI measures a stable

personality trait. The authors report findings that differentiate the ASI from the STAI-T, and indicate strong support for construct validity of the ASI (Peterson & Reiss, 1992).

6.3.13 Self – efficacy

Self-efficacy was measured using the Self Efficacy Scale (SES: Sherer et al., 1982). The SES (Appendix H) was also completed as part of a battery of questionnaires provided at the initial assessment interview and again six months following CBT for late-life GAD. The SES is a 30-item scale designed to assess generalized self-efficacy (17 items), and social self-efficacy (6 items), leaving a total of 23 scored items and 7 "filler" questions. Items are rated from A to E with respect to degree of agreement with the statements about personal attitudes and traits, from "disagree strongly" to "agree strongly," and answers are converted to scores of 1 to 5. The items were summed to produce a General Self-efficacy subscale score and a Social Self-efficacy score, with higher total scores reflecting greater self-efficacy. The subscale scores are not summed to give an overall score.

In construction and validation of the scale reliability coefficients obtained for the General and Social self-efficacy subscales were 0.86 and 0.71 respectively (Sherer et al., 1982), and the authors reported evidence of construct and criterion validity of the Self-Efficacy Scale. Evidence of psychometric support for the SES in older adults is limited, however, in an investigation of the psychometric properties of the SES in a sample of older adults with generalised anxiety, Stanley et al. (2002) found strong internal consistency for both General and Social subscales (alpha = 0.91 an 0.78 respectively) and evidence for adequate validity of this measure. Previous investigations of the SES in a sample of anxious older adults (Stanley, et al., 2002) indicate lower levels of self-efficacy and outcome expectancies in older adults with GAD (SES General; $M = 54.4$, $SD = 11.09$; SES Social; $M = 18.04$, $SD = 4.17$) relative to published data from younger adult control samples and older adult samples (SES General; $M = 64.3$, $SD = 8.58$; SES Social; $M = 21.2$, $SD = 3.63$).

6.3.14 Locus of Control Beliefs

Perceptions of control over anxiety- related events

The Anxiety Control Questionnaire (ACQ: Rapee, et al., 1996) was used to assess perceived control over anxiety-related events (Appendix I). The ACQ is a 30-item inventory including beliefs regarding perceived control over a variety of potentially threatening internal events and situations. These include mental or physical reactions, disasters, and control over other people. The ACQ was completed as part of a battery of questionnaires provided at the initial assessment interview and again by those participants who took part in treatment, at six-month follow-up. Participants responded to the 30 propositions (e.g., "I am usually able to avoid threat quite easily") by rating their agreement on a 6-point scale from 0 = "strongly disagree" to 5 = "strongly agree." A 6-point scale was used to force respondents to select either end of the scale and minimise response bias. Scoring consisted of totalling the values such that higher scores indicate greater perceived control. Early investigations of validity amongst young adults populations revealed anxious populations to score in the low to mid 70s on average, whilst non-clinical samples score in the mid to high 90s (Rapee, et al., 1996).

The Cronbach's alpha for the overall scale was 0.87 in a clinically disordered population, and 0.89 with a non-clinical population, indicating that the items in the questionnaire have a high degree of internal consistency. The internal consistency of the ACQ has been found to be higher than that found for Rotters' (1966) Locus of Control questionnaire, suggesting that the ACQ contains more homogeneous items than the previous scale, and is also reported to predict anxiety more strongly (Rapee, et al., 1996). In addition, the authors report strong test-retest reliability of the ACQ over a month, indicating utility for treatment outcome studies and measuring change across time, and is reported to show good convergent and discriminate validity.

6.3.15 Measures of negative life events

Stressful life events preceding onset of DSM-IV-L disorders

Information on the occurrence of stressful life events preceding the onset of anxiety, depression and other DSM-IV disorders was collected during the initial assessment interview using the ADIS-IV-L (Di Nardo, et al., 1994), as previously described in section 6.3.1. As part of the interview, participants were asked whether they were under any stress during the period of time at which they reported symptoms to have begun,

and were questioned about difficulties or changes in i) family and/or relationships; ii) work and/or school; iii) finances; iv) legal matters; v) the health of themselves or others, and; vi) 'other'. The occurrence of changes or difficulties in any of these areas was answered 'yes' or 'no, ' and participants were able to provide further detail as to the type of difficulties and/or change experienced.

Types of stressful life changes or difficulties reported to be experienced by participants in each of the six domains assessed, (i.e., family or relationships, occupation or education, finances, legal difficulties, health, and other) were collated and coded from 0 to 6, where higher scores reflect greater disruption or life change. Coding was based on events listed in the Social Readjustment Rating Scale (SRRS: Holmes & Rahe, 1967). The SSRS contains 43 events which are assigned a value ranging from 11(minor violations of the law) to 100 (death of a spouse) to reflect the level of life-change brought about by this event. Events reported by participants were thus classified in order of increasing severity to reflect the level of life change brought about, based on events listed in the SSRS and their corresponding rating. For example, events relating to changes in family relationships as reported by participants ranged in severity from 1 = "estrangement from a family member' to 6 = 'death of a spouse.' Changes in finances included items such as 'owing on a mortgage or debt', and 'change in financial situation', whilst work related events included items ranging from 'beginning or ending school', to 'being fired'. Health events included items such as 'change in the health of a family member' and 'major personal illness or injury' and events classified as 'other' included 'change in residence and/or relocation', 'children leaving home', and 'war-time experiences'.

Negative life events

Negative life events were measured using the Negative Life events Questionnaire (Kraaij & de Wilde, 2001) (see Appendix J), an adaptation of the Life Events Questionnaire used in the World Health Organisation multicentre study on parasuicide (Kerkhof, Schmidke, Bille-Brahe, De Leo, & Lonnqvist, 1994). The adapted version was extended to include questions relating to the experience of negative life events specific to older adults, for example, the occurrence of dementia in ones partner. In addition, questions are asked for an additional developmental period, late adulthood,

defined as the period spanning 50 years of age and onwards. The Negative Life Events Questionnaire consists of 107 items which ask questions about negative life events concerning oneself and significant others (i.e., parents, siblings, partners, children, and other people considered to be important to the interviewee). The questionnaire is a lifetime instrument as the occurrence of events is questioned across four different developmental periods ranging from childhood to the year prior to the interview, i.e. 'childhood' (0-15 years of age), 'adulthood' (16-49 years), 'late adulthood' (50 years of age to 1 year prior to the interview), and '12 months prior to interview'. Positively answered items were followed by questions concerning the time period(s) in which the event occurred.

Items on the Negative Life Events questionnaire were classified as belonging to one of ten negative life event clusters: death of significant others (e.g., a parent, partner, or child); severe illness of self; severe illness of a significant other; negative socio-economic circumstances (e.g., financial problems with self or partner); sexual abuse; physical abuse; emotional abuse and neglect; crime, disaster and war (CDW) events; relational stress, and; problem behaviour of significant others. Scores for all ten categories were obtained for the four different developmental periods identified, and for the whole life span overall. The number of events in each of the ten categories experienced within each developmental period was also calculated to give a period score. Four types of scores were obtained; (1) reflecting the experience of an event within the life event categories (a dichotomous category score); (2) a quantity cluster score, to reflect the quantity of events experienced within the life event category; (3) a dichotomy period score, reflecting the experience of some event within the developmental period; and (4) a quantity period score, reflecting the quantity of events experienced within the developmental period.

6.4 Procedure

Prior to the commencement of the study, ethical approval was granted by the Australian National University's Human Research Ethics Committee. All participants were provided with a written information sheet outlining the aims of the research and an overview of what participation involved (Appendix K), and signed a consent form (Appendix L) prior to their participation. Participants recruited to the study as described above (Section 6.1) were screened for eligibility and then invited to take part in clinical assessment interviews. All appointments were conducted at The School of Psychology at the Australian National University (ANU), with the exception of one interview, which was conducted in the participant's home due to difficulties with mobility. Interviews conducted at the ANU were held in a quiet, soundproof room. Participants were told that the interview would take two to three hours, or could be conducted over two meetings if they preferred. In order to minimise participant fatigue, the investigator provided participants with breaks as needed, and water, tea and coffee were readily available. Participants were advised that they could refuse to answer any questions that they were not comfortable answering, and that they could withdraw from the study at any time. Any questions regarding participation were addressed both prior to and following completion of the assessment.

The first component of the interview involved an assessment of cognitive functioning to determine eligibility for the study. To this end, participants were first administered the Addenbrooke's Cognitive Examination (ACE: Mathuranath, et al., 2000). This was followed by clinical assessment and diagnosis of both current and past (lifetime) episodes of DSM-IV anxiety and mood disorders using the ADIS-IV-L (Di Nardo et al., 1994). All diagnostic interviews were conducted by the principal investigator, who had been trained to criteria on the ADIS-IV-L by supervisors with expertise in the diagnosis and treatment of anxiety. Inter-rater reliability for principal diagnoses and age at onset was assessed by having an independent post-graduate student who had completed Master's level coursework in clinical psychology, was trained in ADIS-IV-L administration and blind to the study aims and design, review 22 randomly selected audio recordings of the diagnostic interview (See Appendix M for inter-rater reliability forms). Following administration of the ADIS-IV-L, participants were asked questions about themselves, their family, and their medical history in further detail. This sub-

section of the initial interview was conducted as a semi-structured interview and consisted of both closed and open-ended questions, as set out in Appendix D.

On completion of the diagnostic assessment interview participants were offered a break of fifteen minutes by the investigator before proceeding to the assessment of negative life events. Alternatively, participants were given the option of returning for a second appointment to complete this stage of the interview. For those participants opting to return to complete the interview, a date and time was scheduled at the participant's convenience, within two weeks of their initial assessment. Participants were then debriefed, and any questions they had were addressed. Participants continuing on were informed that for this part of the interview, they would be asked specific questions about various life events involving themselves, their parents, their siblings (brothers and sisters), their partner/s, and their children. For each question answered positively, participants were asked to indicate the period in their life during which particular events were experienced. These periods were classified as i)"Childhood" (from 0 to age 15); ii) "Early and middle adulthood" (from age 16 to age 49); iii) "Late life" (from age 50 onwards), and; iv) "In the last 12 months" (the year prior to interview). Time periods, including the specified age ranges, were provided to the respondent on a sheet of paper to refer to throughout the interview. Participants were asked to answer 'yes' or 'no' to questions, and to let the investigator know of any questions that did not apply to them or their circumstances. At completion of this final stage of the interview, participants were debriefed, and any questions they had were addressed.

Participants were also asked to complete a battery of self-report psychometric scales which were given to participants following completion of the initial interview. This comprised the Geriatric Depression Scale - 15 (GDS-15), the Geriatric Anxiety Inventory (GAI), the Spielberger State-Trait Anxiety Inventory – Trait scale (STAI-T), the Penn State Worry Questionnaire (PSWQ), the Anxiety Sensitivity Index (ASI), the Self Efficacy Scale (SES) and the Anxiety Control Questionnaire (ACQ) (See Appendices E through to J). Participants were instructed to complete the questionnaires within one-week of the initial interview and to return the questionnaires to the investigator in the stamped, self-addressed envelope provided. Participants were informed they could contact the primary investigator if they required help, or had any questions regarding completion of the questionnaires. In order to protect the anonymity

and confidentiality of participants, completed questionnaires were de-identified and stored separately from signed consent forms.

Treatment- seeking participants interested in taking part in a study involving a twelve-week CBT program for anxiety were informed that that they would be contacted once their questionnaires had been returned to discuss eligibility and commencement of participation in the second phase of the present study (outlined in Section Three of this thesis). Those participants who were either unsuitable to take part in the treatment study (Chapter Eleven), or required urgent help and/or treatment were provided with onwards referrals as necessary to private psychologists, general practitioners, or to the Older Person's Community Mental Health team.

CHAPTER SEVEN

Initial Data Screening and Establishment of a Bimodal Distribution of Onset in late-life Anxiety disorders

7.1 Data Analysis

7.1.1 Analysis plan

Analysis of age at onset

In order to address the research questions of whether there exists two subpopulations of older adults ("early onset" and "late onset") with GAD, and secondary to this; if there are two subpopulations, what cut-off best determines to which subpopulation a given age of onset belongs (Chapter Seven), a single-distribution model of the data was compared with one allowing for a mixture of the two distributions (McLachlan & Peel, 2000). The distributions used in this study are Gamma probability density functions (pdfs) because they are defined on the nonnegative real line (i.e., $[0, \infty]$). The single-distribution model may be written as $Y \sim f(a, b)$, where f is a Gamma pdf with parameters a and b. The tilde symbol (~) denotes "is distributed as." The mixture-distribution model may be written as $Y \sim qf(a, b) + (1 - q)\, g(c, d)$, where f and g are Gamma distributions and q is a mixture parameter taking a value in the [0, 1] interval. Maximum-likelihood estimation is feasible for fitting both models, and was the estimation procedure used for this analysis. Although age at onset of GAD was of primary interest in this investigation, data was also collected on age at onset of the presenting disorder at assessment, and of first lifetime onset of any DSM-IV disorder. Distributions of onset for DSM-IV-L anxiety disorders, primarily GAD, and DSM-IV-L disorders of any kind were both tested using gamma pdfs, and the results for both of these are reported. An interrater reliability analysis using the Kappa statistic was performed to determine consistency among raters.

Comparison of early- and late-onset groups

Independent-samples t-tests and Chi-square (χ^2) analyses were conducted to determine whether early-and late-onset groups statistically differed on demographic variables of age, gender, marital status, education, occupation and employment status, and social support (See Chapter Eight). In addition, the relationship between age at onset of GAD

and health characteristics such as indices of chronic disease, medication use, treatment history, self-perceived health, and functional limitations were examined using χ^2 analyses and independent-samples t-tests. Genetic factors (i.e. family history of psychiatric illness) were also compared for between group differences. Calculation of t was based on the assumption of equal variances; t-values, degrees of freedom and significance based on Levene's test for equality of variances are reported for variables found to have unequal variances. These variables included age at first onset of a DSM-IV-L disorder of any kind and of a DSM-IV-L anxiety disorder, duration of illness since first episode onset, number of non-prescription medications, and functional limitations. Inspection of these variables indicates that in general, EO participants appear to be more similar to one another, whereas LO participants appear to vary from one another to a greater degree.

Independent-samples t-tests and χ^2 analyses were conducted to determine differences between onset groups in psychiatric comorbidity, the severity of GAD-related worries and symptoms, the percentage of participant's day spent worrying, interference and distress associated with GAD symptoms, interviewer-rated severity of GAD and symptoms of anxiety, worry and depression (Chapter Nine). Differences in the frequency and severity of stressful life events reported to precede onset of current and past DSM-IV disorders assessed were also investigated using χ^2 analyses and independent-samples t-tests (Chapter Ten). No participants reported problems with the law/legal difficulties to occur prior to onset of current or past episode of psychopathology and therefore this variable was not analysed. Negative life events data were analysed to determine the frequencies of the different clusters of negative life events for both EO and LO groups. The bivariate relationship between the various clusters of negative life events and symptoms of psychopathology in older adults with EO and LO GAD were examined using Pearson's correlations. It was expected that correlations between negative life events and scores on measures of anxiety, worry and depression would be positive, indicating that the experience of one or more negative life event was related to higher scores on psychometric measures of pathology. Independent-samples t-tests were also conducted to investigate whether early- and late-onset groups differed with regard to the quantity of specific events experienced in each developmental period and across the lifespan, in addition to whether onset groups differed with regard to the quantity of total life events experienced in each developmental period and throughout life.

7.1.2 Data preparation and screening

All data collected were entered and analysed using the Statistical Package for the Social Sciences version 14 (SPSS 14: SPSS Inc, 2005), and version 16 (SPSS 16: SPSS Inc, 2008) when it became available. Three participants had missing data on assessment of cognitive status, and were therefore omitted from this analysis. Component scores were summed to calculate overall scores on the Addenbrooke's Cognitive Examination (ACE: Mathuranath, et al., 2000) and the Mini Mental Status Examination (MMSE). Inspection of the distribution of scores indicated that three participants scored below the cut-off of 83 on the ACE, used to identify cognitive decline. One of these participants' scored 79, whilst the other two participants had a score of 82 on the ACE. Given that these scores were just below the cut-off of 83, the fact that anxiety and depression can affect memory and concentration considerably, and that these participants reported no concerns of memory loss, a decision was made not to exclude these participants from subsequent investigations.

Five participants did not return any psychometric measures and of the 76 participants who completed the initial assessment interview, seven participants did not complete the Negative Life Events Questionnaire. These participants were therefore omitted from analyses pertaining to these measures (Chapters Nine and Ten, respectively). Of the remaining 71 participants who returned the battery of questionnaires, all items were returned complete. Scores on the relevant items of the Geriatric Depression Scale (GDS-15: Sheikh & Yesavage, 1986b), the Penn State Worry Questionnaire (PWSQ: Meyer, et al., 1990), the Spielberger State-Trait Anxiety Inventory- Trait scale (STAI-T: Spielberger, et al., 1983) and relevant subscale items of the Self Efficacy Scale (SES: Sherer, et al., 1982), and Anxiety Control Questionnaire (ACQ: Rapee, et al., 1996) were reversed. Item scores were summed to calculate the relevant overall and/or subscale scores on the Geriatric Anxiety Inventory (GAI: Pachana, et al., 2007), the PWSQ, the GDS-15, the STAI-T, the Anxiety Sensitivity Inventory (ASI: Peterson & Heilbronner, 1987; Peterson & Reiss, 1987), the SES, and the ACQ. Internal reliabilities were calculated for all of these scales and are presented in Table 7.1. The SSE subscale was found to have low internal reliability that was not further improved by item deletion. Reliabilities for each of the remaining scales and subscales range from good to excellent.

Table 7.1

Internal Reliabilities of Psychometric Scale Scores

Scale	Cronbach's α
The Geriatric Anxiety Inventory (GAI)	0.86
The Penn State Worry Questionnaire (PSWQ)	0.86
The Geriatric Depression Scale -15 (GDS-15)	0.78
The State-Trait Anxiety Inventory – Trait scale (STAI-T)	0.90
The Anxiety Sensitivity Index (ASI)	0.92
The Self Efficacy Scale (SES)	
General Self Efficacy (GSE)	0.86
Social Self Efficacy (SSE)	0.63
The Anxiety Control Questionnaire (ACQ)	0.83

Prior to data analysis, data were screened for accuracy of data entry, missing values, univariate outliers, and fit between their distributions and the assumptions of analysis (normality, linearity, homoscedasity). Inspection of the scale distributions revealed that all scales and subscales were normally distributed. The distribution for the GDS-15 illustrated a slight positive skew and kurtosis, indicating that most participants reported lower levels of depression as measured by the GDS-15. This is not surprising given that the majority of participants had a principal or co-principal (i.e., most severe) diagnosis of GAD according to DSM-IV-TR criteria and reported symptoms of anxiety rather than depression to be their primary problem of concern. For this reason, a decision was made not to transform this variable. No univariate outliers were identified.

Data Reduction

In order to maximise the power of analyses, the number of categories of most of the demographic variables were collapsed into two categories. These variables and their revised categories included ethnicity, marital status (single or partnered), level of education (secondary or tertiary), employment status (employed or unemployed/retired) and occupation (non-professionals or professionals). Individual medical conditions were also further collapsed into categories reflecting the type of condition.

The two marital status categories were formed by combining the single, separated or divorced, and widowed categories into one single category and maintaining the married/in a relationship category. Given that all participants had above primary level education, levels of education categories were formed by removing the primary education category. The high school for less than 4 years ('intermediate certificate) and graduated high school (matriculation) categories were combined to form the secondary education category, and the college or some technical education, undergraduate and postgraduate degree categories were combined to form one tertiary education category. The employment status categories were formed by combining the retired and unemployed categories and maintaining those in the employed category.

Due to the range of occupational categories participants fell into, the occupation categories were formed by combining those from a medical, academic and scientist background, those with a military background (army, navy, air force) having advanced training and education through the Australian Defence Force Academy (ADFA), and those with occupations requiring university qualifications into one professional/skilled category. Tradespersons, labourers and related workers, clerical and service workers, intermediate and elementary workers in production, transport, clerical positions, sales and marketing, in addition to positions such as security, sewing and dressmaking and homemaking were combined to form one non-professional category. Occupation was coded into these two categories according to the Australian Standard Classifications of Occupations (Australian Bureau of Statistics, 1997).

As a group, participants had 42 different current medical disorders. The categories or types of medical conditions were formed by combining conditions identified as belonging to the same illness groups based on DSM-IV-TR (APA, 1994) classification. Accordingly, the experience of headaches and migraines were combined to form the diseases of the nervous system category. Congestive heart failure, pulmonary embolism, cardiac disease, sub-ventricular tachycardia, enlarged heart, angina, and hypertension were all combined to form one category reflecting a cardiac condition. Asthma and pneumonia were combined to form one category representing respiratory disease. Diabetes and thyroid conditions were combined under one category representing endocrine/metabolic conditions. The category digestive and gastrointestinal conditions was formed by combining constipation, diarrhoea, irritable bowel syndrome, reflux, and stomach aches, pains and spasms. The category eye and ear conditions was formed by

combining cataract, eye disease, and hearing loss. Arthritis, osteoporosis, and degenerative conditions of the spine were combined to form the category musculoskeletal/connective tissue conditions. Due to expected cell counts of less than five for some groups of non-prescription medications, these medications were also further collapsed. Vitamins, minerals, folate, and fish oil were combined to form the category of health supplements.

7.2 Descriptive Analysis

7.2.1 Cognitive status

Descriptive statistics were conducted to examine the cognitive status of participants. The current sample of participants were found to be cognitively intact, with participants', on average, scoring well above the cut-off scores indicative of cognitive decline, on both the MMSE (M = 29.10, SD = 1.08) and the ACE (M = 93.04, SD = 4.48).

7.2.2 Psychiatric diagnoses and comorbid psychiatric conditions of the presenting episode

Descriptive statistics were conducted to investigate the diagnostic characteristics of participants' presenting episode of psychiatric illness. Current and comorbid psychiatric conditions at time of evaluation are presented in Table 7.2. Overall, a total of 59.2% of the sample had at least one co-existing diagnosis at time of evaluation. Based on a review of 22 audiotapes by an independent rater, raw percent agreement on primary diagnoses between the investigator and independent rater was 100%, Kappa = 1.00 ($p <$ .001).

Table 7.2

Psychiatric Diagnoses and Comorbid Psychiatric Conditions at Evaluation (N = 76)

Variable	*f (%)*	*(n)*
Primary/principal diagnosis		
Generalised anxiety disorder	96.0	(73)
Panic disorder	2.8	(2)
Phobias (social, specific, agoraphobia)	1.4	(1)
Secondary comorbid diagnosis		
Generalised anxiety disorder	4.2	(3)
Panic disorder	8.5	(6)
Phobias	9.9	(7)
Obsessive-compulsive disorder	1.4	(1)
Post-traumatic stress disorder	2.8	(2)
Major depressive disorder, single	4.2	(3)
Major depressive disorder, recurrent	15.5	(11)
Panic symptomatology (subsyndromal)	12.7	(9)
Tertiary comorbid diagnosis		
Phobias (social, simple, agoraphobia)	1.4	(1)
Obsessive-compulsive disorder	2.8	(2)
Post-traumatic stress disorder	1.4	(1)
Major depressive disorder, recurrent	5.6	(4)
Panic symptomatology (subsyndromal)	2.8	(2)

7.2.3 Age at onset of the current episode of psychiatric illness

Descriptive statistics were conducted to investigate the age at onset of participants' presenting episode of psychiatric illness, as identified from the ADIS-IV-L (Di Nardo et al., 1994). Participants' mean age at onset of the presenting episode was 63.67 (SD = 6.6) years, with an age range from 55 to 84 years. Participants' mean age at onset of their current DSM-IV disorder was 59.0 (SD = 6.6) years, with a range from 40 to 78 years of age. The distribution for age at onset of the presenting disorder at evaluation is shown in Figure 7.1. Raw percent agreement on age at onset of the presenting disorders was 97%. The interrater reliability was found to be Kappa = 0.83 ($p < .001$). Of the four participants on whom assessment of age at onset differed, raters were found to be within twelve months of each other for age at onset.

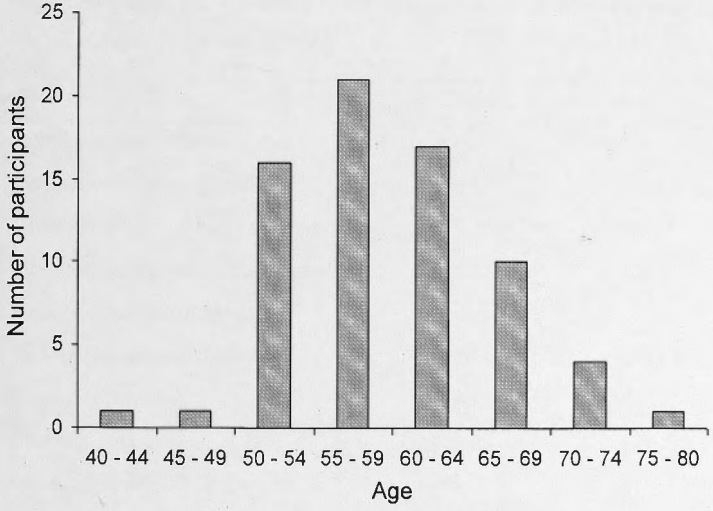


Figure 7.1. Distribution of age at onset of the presenting (current) disorder (N = 76)

7.2.4 Psychiatric diagnoses and comorbid psychiatric conditions at first onset of a DSM-IV-L anxiety disorder

Descriptive statistics were conducted to investigate the diagnostic characteristics of participants at onset of first lifetime DSM-IV anxiety disorder. Psychiatric diagnoses and comorbid conditions assigned to first lifetime onset of an anxiety disorder are presented in Table 7.3. Over four fifths of participants' met criteria for a principal

diagnosis of GAD. Just under half of the sample had at least one co-existing diagnosis in addition to a principal diagnosis of GAD, PD, or a phobic disorder, also presented in Table 7.3. Based on a review of 22 randomly selected diagnostic audio recordings, raw percent agreement on primary diagnoses, which included GAD, PD and social phobia, was 92%. The inter-rater reliability was found to be Kappa = 0.84 ($p < .001$). Diagnoses made by the investigator and rater differed for one of the reviewed interviews, whereby the investigator made a diagnosis of GAD and the rater PD. For this patient, the investigator had also made a diagnosis of PD in addition to GAD, though this was assigned as a secondary condition.

Table 7.3.

Principal Diagnoses and Comorbid Psychiatric Conditions of Participants at First Onset of an Anxiety Disorder (N = 85)

Variable	*f (%)*	*(n)*
Primary/principal diagnosis		
Generalised anxiety disorder	83.7	(72)
Panic disorder	9.3	(9)
Phobias (social, specific, agoraphobia)	2.3	(2)
Secondary comorbid diagnosis		
Generalised anxiety disorder	10.6	(9)
Panic disorder	4.7	(4)
Phobias	8.2	(7)
Obsessive-compulsive disorder	1.2	(1)
Post-traumatic stress disorder	1.2	(1)
Major depressive disorder, single	14.1	(12)
Major depressive disorder, recurrent	1.2	(1)
Panic symptomatology (subsyndromal)	7.1	(6)
Tertiary comorbid diagnosis		
Major depressive disorder, recurrent	2.4	(2)
Panic symptomatology (subsyndromal)	1.2	(1)

7.2.5 Age at onset of first DSM-IV-L anxiety disorder

Descriptive statistics were conducted to investigate the age at onset characteristics of participants at first onset of a DSM-IV anxiety disorder of any kind. Participants' mean age at onset of first DSM-IV anxiety disorder, primarily GAD (83.7%), was 40.22 (SD = 19.5) years, with age at onset ranging from 4 to 72 years. The distribution for age at first onset of a DSM-IV anxiety disorder is shown in Figure 7.2. Raw percent agreement on age at first onset of an anxiety disorder was 99%, Kappa = 0.77 ($p <$ .001). Of the participants on whom assessment of age at onset differed, raters were found to be within twelve months of each other for age at onset.

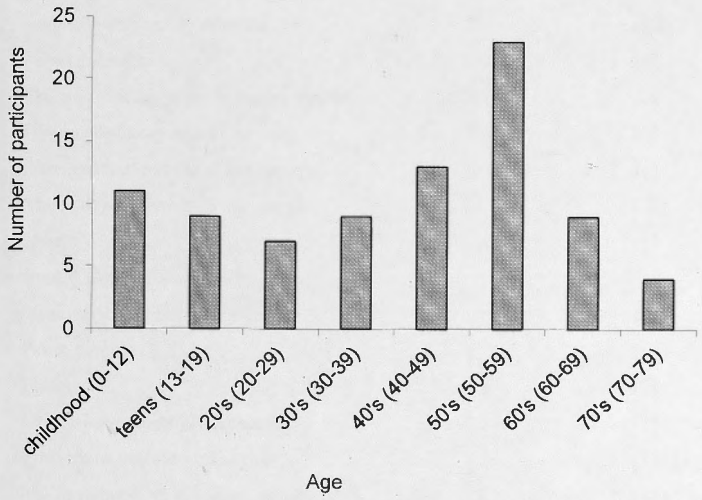


Figure 7.2. Distribution of age at onset of first lifetime DSM-IV anxiety disorder (N=85)

7.2.6 Psychiatric diagnoses and comorbid psychiatric conditions at first onset of a DSM-IV-L disorder of any kind

Psychiatric diagnoses and comorbid psychiatric conditions assigned to first lifetime onset of a DSM-IV disorder of any kind are presented in Table 7.4. As seen in Table 7.4, the majority of participants' had a primary diagnosis of GAD at first onset of a psychiatric condition of any kind. A total of 49.4% of the sample had at least one co-existing diagnosis.

Table 7.4.

Principal Diagnoses and Comorbid Psychiatric Conditions of Participants at First Onset of a DSM-IV Disorder of Any Kind (N = 85)

Variable	*f (%)*	*(n)*
Primary/principal diagnosis		
Generalised anxiety disorder	75.3	(64)
Panic disorder	5.9	(5)
Phobias (social, specific, agoraphobia)	2.4	(2)
Obsessive-compulsive disorder	2.4	(2)
Post-traumatic stress disorder	1.2	(1)
Major depressive disorder, single	11.8	(10)
Other	1.2	(1)
Secondary comorbid diagnosis		
Generalised anxiety disorder	10.6	(9)
Panic disorder	4.7	(4)
Phobias	8.2	(7)
Obsessive-compulsive disorder	1.2	(1)
Post-traumatic stress disorder	1.2	(1)
Major depressive disorder, single	15.3	(13)
Major depressive disorder, recurrent	1.2	(1)
Panic symptomatology (subsyndromal)	5.9	(5)
Other	1.2	(1)
Tertiary comorbid diagnosis		
Generalised anxiety disorder	1.2	(1)
Panic symptomatology (subsyndromal)	1.2	(1)

7.2.7 Age at onset of first lifetime DSM-IV disorder of any kind

Descriptive statistics were conducted to investigate the age at onset characteristics of participants at first onset of a DSM-IV disorder of any kind. Participants' mean age at onset of first DSM-IV disorder of any kind was 38.20 (*SD* = 19.8) years, with a range from 4 to 72 years. The distribution for age at onset of first DSM-IV disorder of any kind is shown in Figure 7.3. As seen in Figure 7.3, the distribution for age of onset appears flat from 'childhood' to the '30's', with a large number of participants reporting the onset of a psychiatric illness in their 40's and 50's.

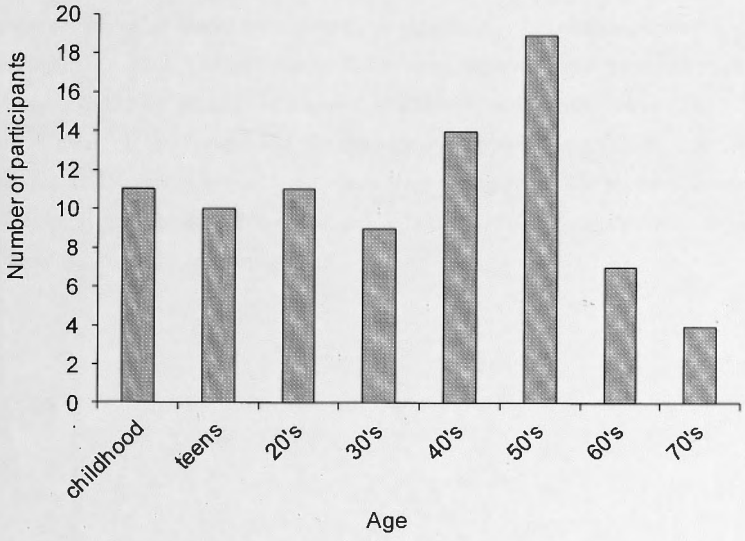


Figure 7.3. Distribution of age at onset of first lifetime DSM-IV disorder of any kind

7.3. Identification of a Bimodal Distribution of Onset

7.3.1 Distribution of age at onset of first DSM-IV-L anxiety disorder

A single distribution model of the data was compared with one allowing for a mixture of two distributions to determine whether there exists two sub-populations of older adults with GAD or one, based on age at onset of first lifetime DSM-IV anxiety disorder data, presented above in section 7.2.5. Using a maximum-likelihood estimation procedure, the log-likelihood of the single-distribution model was $LL1 = 381.39$, whereas the log-likelihood of the mixture-distribution model was $LL2 = 358.69$. The χ^2 statistic for improvement in model fit was $\chi^2(3) = 2(LL1 - LL2) = 45.39$, $p < .0001$. The mixture-distribution model was found to be significantly better fitting than the single-distribution model. The mixture-model's component Gamma probability density functions (pdfs) are depicted in Figure 7.4. The left-hand distribution is f (3.16, 0.19) with a mean of 16.77 years and the right-hand distribution is g (21.70, 0.51) with a mean of 52.85 years. The two distributions are well-separated. The mixture parameter q = .35, implying that about 35% of the sample belong to the EO subpopulation and about 65% belong to the LO subpopulation.

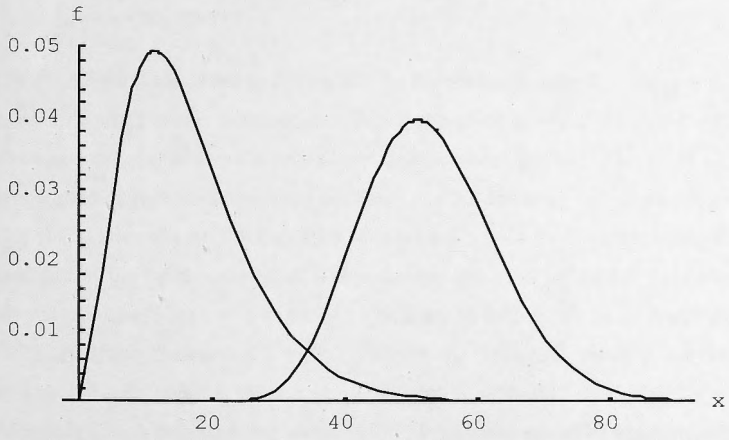


Figure 7.4. Gamma probability density function (pdf) distribution applied to the distribution of age at onset of first lifetime anxiety disorder

7.3.2 Distribution of age at onset for first DSM-IV-L disorder of any kind

To determine whether there exists two sub-populations of treatment-seeking older adults with a DSM-IV mood or anxiety disorder based on age at onset of first lifetime DSM-IV disorder of any kind, a single distribution model of the data was compared with one allowing for a mixture of two distributions. The log-likelihood of the single-distribution model for this data was found to be $LL1 = 377.16$, whereas the log-likelihood of the mixture-distribution model was $LL2 = 361.81$. The χ^2 statistic for improvement in model fit was $\chi^2\ (3) = 30.71$, $p < .0001$. As with findings for onset of anxiety, the mixture-distribution model was found to fit the data significantly better than the single-distribution model. The left-hand distribution is f (2.98, 0.15) with a mean of 19.73 years and the right-hand distribution is g (26.12, 0.49) with a mean of 52.90 years. The mixture parameter q = .44, implying that about 44% of the sample belong to the EO subpopulation and about 56% belong to the LO subpopulation. As such, the results for the onset of any disorder were quite similar to the foregoing because in the majority of instances the age of onset for any disorder was identical to that for anxiety; the main difference being due to several cases whose age of onset for any disorder (primarily major depressive disorder) was earlier.

7.3.3 Determination of a threshold for best distinguishing "early-onset" from "late-onset" anxiety

The cut-off point identified to distinguish the EO group from the LO group was the age at which the pdf curves intersect, as this was the point at which the probability that a given age of onset belonged to either subpopulation was identical. This point was found by standard numerical root-finding methods, and the resulting cut-off was found to be 34.4 years. The estimated probabilities of misclassification are the areas under the right-hand tail of the "early onset" pdf and under the left-hand tail of the "late onset" pdf beyond the cut-off-age (see Figure 7.4). These are as follows: Pr (false "early onset") = .0225; Pr (false "late onset") = .0517. Given the 35%-65% mixture, the estimated misclassification rate for the entire population is .35*.0517 + .65*.0225 = .0372. Accordingly, it is expected that about 96.7% of the cases would be correctly classified. Figure 7.5 shows the mixture-distribution fitted to a histogram of the data. The mixture-distribution model accurately captures the mean (40.33) and overall shape of the distribution.

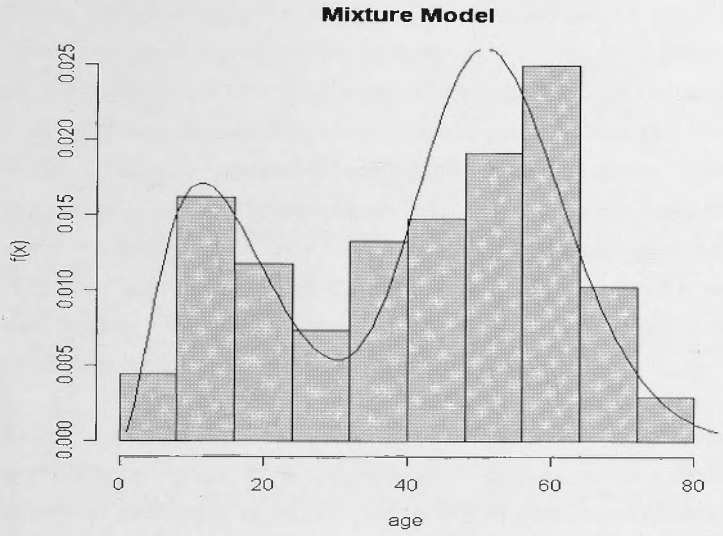


Figure 7.5. Mixture distribution fitted to age at onset of first anxiety disorder data

The shape of the distribution and the observation that a proportion of the sample reported an onset of anxiety in their 30's and 40's raised the question as to whether there might be more than two subpopulations distinguished by onset. This was tested by fitting a three-distribution model to the data to ascertain whether its fit was significantly better than the two-distribution model. The χ^2 statistic for improvement in model fit was χ^2 (3) = 7.20, p = 0.066. The improvement was not significant. Based on the identified cut-off of 34.4 years, 32.94% (28) of the sample was identified as having EO anxiety, and 59.06% (57) was identified as having a LO anxiety disorder.

7.4 Discussion

Current and lifetime onset of clinically significant symptoms of DSM-IV anxiety disorders were assessed in the present study in order to investigate whether there exists two sub-populations of older adults representing a group with "early onset," and "late onset" of anxiety, or just one population of anxious older adults. Using a Maximum-likelihood estimation procedure to apply gamma probability density function (pdf) distributions to the data, the present study tested both a single and mixed-distribution model to determine which distribution fit the data best. Results revealed a bimodal distribution for first lifetime onset of a DSM-IV anxiety disorder, of which the majority was found to be GAD, with the mixture-distribution model being found to be significantly better fitting than the single distribution model.

According to the mixed-model distribution, the mean age at onset of participants' identified as belonging to the EO sub-group was 16.77 years, and mean age at onset of participants identified as having LO anxiety was 52.85 years. As with findings for first onset of an anxiety disorder, the mixture-distribution model fit the data for first onset of any DSM-IV psychiatric disorder significantly better than the single distribution model. Accordingly, the mean age at onset of participants' identified as belonging to the EO group was 19.73 years. Participants identified as having LO of any disorder had a mean age at onset of 52.90 years.

Given support for a bimodal distribution was found, a secondary aim of the present study was to establish a cut-off point that best determines to which subpopulation a given age of onset belongs. Using standard numerical root-finding methods, a cut-off of 34.4 years was identified as the point at which the pdf curves intersect, and at which the probability that a given age of onset belonged to either subpopulation would be identical. Based on this cut-off, participants reporting onset of an anxiety disorder prior to and including 34 years of age in the present study were classified as having an EO disorder. Participants with an onset of anxiety at 35 years or later were identified as part of the LO group.

Despite previous investigations reporting the observation of a bimodal distribution for age at onset of anxiety (Hoehn-Saric, et al., 1993; Le Roux, et al., 2005; Raj, et al., 1993), the use of a maximum-likelihood estimation procedure to test the fit of a single

or two-distribution model to the current data and thus determine modality of the attained distribution of onset represents a significant advancement on previous research. An advantage of this procedure is that the threshold used to identify both early- and late-onset groups are determined by empirical means. Previous investigations of an onset distinction in both the depression and anxiety literature have looked at age of onset categorically, according to a pre-determined cut-off. As previously highlighted, in samples of mixed age, the median age at onset of a distribution has generally been used as the cut-off (Brodaty, et al., 2001). This cut-off can range from 20 to 60 years in studies across the anxiety literature (Lenze, et al., 2005; McCabe, et al., 2006; Raj, et al., 1993). The current study did not use the mean or median age at onset of the distribution, but derived the cut-off based on application of a statistical model to identify the point at which the probability of falling on either side of the distribution was equal. Using numerical root-findings methods, the resulting cut-off identified to distinguish participants classified as having an early-or late-onset anxiety disorder was 34.4 years.

A further advantage of the statistical procedure used in the present study is that it allows for the calculation of an estimated probability of misclassification. Based on the identified cut-off of 34.4 years, it is expected that 96.7% of cases from this sample would be correctly classified as being EO or LO. That is, only 3.3% of cases are likely to be misclassified. Accordingly, aside from limitations associated with retrospective recall of onset of an episode of illness, this methodology presents a means of identifying a cut-off specific to the sample which is highly accurate and minimises the probability of misclassification that may result when arbitrary cut-off points are selected by the researcher.

By eliciting the age at onset of participants' earliest episode of an anxiety disorder, in addition to all subsequent episodes recalled by participants', the current study makes a distinction between age at onset of the presenting disorder at time of evaluation, and age at onset of first lifetime episode of anxiety and other DSM-IV psychiatric disorders. In doing so, the term "late-onset" in the present study referred to those participants whose first onset of an anxiety disorder occurred after the age of 34. This distinction is not clear in previous research (Le Roux, et al., 2005; Raj, et al., 1993; Sheikh, et al., 2004), whereby the term "late-onset" has been variably referred to as i) the onset of anxiety

occurring in late-life based on theoretical definitions of "old age" (i.e. from 50-65 years and older), and does not preclude onset of illness earlier in life; ii) the onset of an anxiety disorder occurring for the first time in old age, without a prior history of psychiatric illness, or; iii) the onset of anxiety occurring for the first time after adolescence or young adulthood, defined as the period in which onset of psychiatric illness is typically thought to occur. Although the first definition appears to refer to a late-life episode as opposed to specifically being a LO episode in late life, the distinction is not often clear in the research literature, as previously outlined in section 3.8.

This lack of clarity as to definitions of "LO" in the investigation of late-life anxiety, and failure to assess lifetime episodes of onset contributes to the ambiguity that exists as to the occurrence of "LO" disorders (Barlow, 1988; Flint, 1994, 1997). In the present study, participants identified as having LO GAD represent a population of older adults whose first onset of anxiety occurs after the age of 34 based on statistical fit of multiple models to the attained distribution of onset. The mean age at onset for this sub-group was identified as 52.85 years indicating that there are indeed a number of anxious older adults who report having their first episode of clinically significant anxiety after the age of 50. By identifying lifetime episodes of psychiatric illness and using a statistically derived age cut-off to distinguish early- and late-onset subgroups, the present study aimed to highlight a methodology that may address this lack of clarity in future research. Though this methodology may result in varying thresholds across studies depending on the sample population, it would allow researchers to build a picture of the age at which LO disorders are likely to occur in a given population, and what is known about LO disorders based on the age-cut-off identified, as distinct from disorders occurring after a pre-selected age reflective of a particular developmental period of life.

In summary, the present data provide evidence for the existence of two sub-populations of community dwelling anxious older adults representing an EO group whose onset of an anxiety disorder occurs at or prior to the age of 34, and a LO group for whom episode onset occurs at 35 years of age or later. Having established a cut-off age to distinguish these subgroups of anxious older adults, the studies reported in subsequent chapters were designed to explore potential differences in the aetiology, phenomenology and response to psychological treatment of these groups.

CHAPTER EIGHT

A Cross-sectional Study of Differences in the Aetiological Correlates of Early- and Late-onset Anxiety

8.1 Introduction

The current chapter presents the findings of an investigation aimed at examining whether there are aetiological differences between early- onset (EO) and late-onset (LO) Generalised Anxiety Disorder (GAD). An empirical comparison of these two onset groups across a range of aetiological factors has the potential to clarify and extend the existing knowledge regarding such differences, which are considered to be important dimensions in classifying and/or differentiating EO and LO anxiety. Whilst participants were assessed for all DSM-IV anxiety disorders in the previous chapter, GAD was found to be the most commonly diagnosed disorder at evaluation (i.e. the presenting disorder), and at first onset of an anxiety disorder of any kind in the present sample. Accordingly, GAD will be the focus of research presented in the current chapter and subsequent investigations presented in this thesis.

Due to limited knowledge about the aetiological differences between early-and late-onset GAD, the study presented in this chapter undertook an exploratory approach. Whilst hypotheses were put forward based upon the literature review outlined in Chapter Three, a combination of both mixed findings concerning the aetiological differences between EO and LO GAD and the methodological limitations of previous investigations (outlined in Sections 3.7 and 3.8) suggest that more evidence is required to substantiate any differences thus far proposed in the literature. Having addressed some of the methodological limitations of previous onset research, as discussed in section 3.9, the present investigation compared participants with EO and LO GAD across a number of demographic characteristics and biological risk factors. The specific relationships and hypotheses addressed in this chapter were previously outlined in section 5.2.2 (see Table 5.1).

8.2 Classification of Anxiety Sub-groups

Participants were classified into two age of onset groups based upon the optimal cut-off procedure for EO and LO GAD, as described in the previous chapter. This optimal cut-off age was found to be 34.4 years. Criteria for this classification was based on the finding that this cut-off age accurately predicted that the probability of a given age at onset for belonging to either sub-population (that is, before or after this cut-off) would be identical (see section 7.3.3). Based on the identified cut-off of 34.4 years, 31.6% (n = 24) of the sample were classified as having EO GAD, and 68.4% (n = 52) were classified as having LO GAD.

All analyses reported in the present and subsequent studies were conducted using a cut-off age of 34.4 to distinguish between EO and LO groups. A decision was made to also conduct all investigations using a cut-off of 50 years in order to ensure that the current research would be directly comparable to previous investigations that have used this cut-off point (Chou, 2009; Le Roux, et al., 2005). Using a cut-off of 50 years, 55.3% (42) of the sample was categorised as belonging to the EO group, and 44.7% (34) was identified as belonging to the LO group. As the primary focus of investigations presented in this thesis was to compare participants using the empirically derived cut-off of 34.4 years and due to word limitations, findings using a cut-off of 50 years were reported only where they differed from those using the cut-off of 34 years.

8.3 Sample Characteristics

8.3.1 Age of onset characteristics

Descriptive statistics for mean age at evaluation and age at onset of current and past episodes of psychiatric illness are presented in Table 8.1. Comparison of means using independent-samples t-tests were performed to examine the differences in age at evaluation and age at onset of current and past episodes of psychiatric illness between EO and LO groups. The findings revealed that onset groups did not differ in mean age at evaluation or in age at onset of the presenting episode. Comparison of onset groups revealed that, on average, participants in the EO group were significantly younger at first onset of a DSM-IV anxiety disorder of any kind than those in the LO group. Similarly, participants in the EO group were found to be significantly younger, on

average, than those in the LO group at age of first onset of a DSM-IV disorder of any kind. Levene's test for equality of variances was highly significant for these two variables, indicating non-equal variances for groups on these two variables. Accordingly, t values, degrees of freedom, and p values reported for these variables are based on Levene's test of equality.

Table 8.1

Descriptive Statistics of Current Age and Age of Onset Characteristics for EO and LO Participants

	Early Onset (n = 24)		*Late Onset (n = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Age at evaluation (years)	61.8	5.6	63.9	6.4	$1.37_{[74]}$
Age at onset of presenting episode (years)	58.5	7.2	59.6	6.2	$0.65_{[74]}$
Age at first onset of any DSM-IV disorder (years)	15.0	6.7	49.5	13.1	$15.16_{[73.19]}$***†
Age at onset of first anxiety disorder (years)	15.0	6.7	52.9	9.8	$19.70_{[63.31]}$***†

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† equality of variances not assumed (Levene's test significant)

A comparison of group differences using a cut-off of 50 years also revealed significant differences. In contrast to the findings using a cut-off of 34.4 years, the LO group was found to be significantly older than the EO group at assessment (t (74) = 2.04, $p < .05$) and at onset of the presenting episode (t (74) = 2.30, $p < .05$) at the $p < .05$ level. Consistent with findings using a cut-off of 34.4 years, those in the EO group were, on average, found to be significantly younger than those in the LO group at first onset of a DSM-IV anxiety disorder (t (57.39) = 12.715, $p < .001$) and at first onset of a DSM-IV disorder of any kind (t (73.10) = 8.554, $p < .001$), equal variances not assumed.

8.3.2 Demographic characteristics

Descriptive statistics for the demographic characteristics of participants are presented in Tables 8.2 through to Table 8.4. Chi-square (χ^2) analyses were conducted to investigate differences in the demographic characteristics of EO and LO participants. The findings of these analyses are also presented in Tables 8.2 through 8.4. Descriptive statistics for gender, ethnicity and marital status are presented in Table 8.2. Females outnumbered males in both EO and LO groups 2:1. The majority of participants were non-indigenous Australians, with a similar proportion of European, Asian and South American participants in each group. The majority of participants were married or in a relationship. A greater proportion of LO participants were single or separated and/or divorced and equivalent amounts were widowed. Analyses revealed no significant differences between onset groups in gender, ethnicity or marital status.

Table 8.2

Gender, Ethnicity and Marital Status of EO and LO Participants

	Early Onset (N = 24)		*Late Onset (N= 52)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Gender					$0.001_{[1]}$
Male	29.2	(7)	28.8	(15)	
Female	70.8	(17)	71.2	(37)	
Ethnicity					$1.49_{[3]}$
Non-indigenous Australian	75.0	(18)	80.7	(42)	
European	16.7	(4)	7.7	(4)	
Asian	4.2	(1)	5.8	(3)	
South American	4.2	(1)	5.8	(3)	
Marital status					$1.88_{[1]}$
Single	4.2	(1)	5.8	(3)	
Married/in a relationship	79.2	(19)	63.5	(33)	
Separated or divorced	12.5	(3)	25.0	(13)	
Widowed	4.2	(1)	5.8	(3)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

The educational and occupational characteristics of EO and LO participants are presented in Table 8.3. The majority of participants were highly educated, with about one third of both EO and LO participants having completed secondary education, and two-thirds of participants in each group having completed tertiary education and/or qualifications. Of those participants who were employed, the majority of early-and late-onset participants were employed in a part-time as opposed to full-time capacity. Employment intensity is likely to be a reflection of the age of the sample, with more than half of the participants in both early-and late-onset groups being retired. The occupations of participants also reflected the high level of education achieved by many participants, with half of the EO group and just over half of the LO group working in professional and/or skilled appointments. The χ^2 analyses revealed no significant differences between EO and LO groups in education, occupation, employment status or employment intensity.

Table 8.3

Education and Occupational Characteristics of EO and LO Participants

	Early Onset (*N* = 24)		*Late Onset* (*N* = 52)		*Significance test*
Variable	*f* (%)	(*n*)	*f* (%)	(*n*)	$\chi^2_{[df]}$
Level of education					$0.05_{[1]}$
Year 8 – 'intermediate'	16.7	(4)	15.4	(8)	
Year 10 - 'matriculation'	16.7	(4)	15.4	(8)	
Tafe/trade qualification	20.8	(5)	40.4	(21)	
University degree	41.7	(10)	15.4	(8)	
Post-graduate degree	4.2	(1)	13.4	(7)	
Occupation					$0.10_{[1]}$
Professional or associate professional	50.0	(12)	50.0	(26)	
Higher administrative or clerical	37.5	(9)	42.3	(22)	
Tradesperson	8.3	(2)	1.9	(1)	
Non-professional	4.2	(1)	5.8	(3)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 8.3 – continued

Education and Occupational Characteristics of EO and LO Participants

	Early Onset (*N* = 24)		*Late Onset* (*N* = 52)		*Significance test*
Variable	*f* (%)	(*n*)	*f* (%)	(*n*)	$\chi^2_{[df]}$
Employment status					$0.18_{[1]}$
Employed	41.7	(10)	36.5	(19)	
Unemployed	12.5	(3)	7.7	(4)	
Retired	45.8	(11)	55.8	(29)	
Employment intensity					$0.61_{[2]}$
Part-time	29.2	(7)	21.2	(11)	
Full-time	12.5	(3)	15.4	(8)	
n/a	58.3	(14)	63.5	(33)	

Table 8.4 presents the social network characteristics of participants. The majority of both EO and LO participants reported that they considered their children, spouse, and friends to be a source of social support. Three-quarters of EO participants and just over one-half of LO participants reported that they considered their children to be a source of social support. Three-quarters of EO participants and just over two-fifths of LO participants reported that their spouse or partner was a source of social support. Over four-fifths of both early- and late-onset participants reported that their friendships were supportive. Regarding the quality of friendships, just under two-thirds of both early and late-onset participants described their friendships as confiding, whilst about one-third of EO and LO participants described their friends as being more like acquaintances as opposed to having close, confiding relationships with friends. Analysis of social demographics revealed that participants with EO GAD report receiving greater social support by their children than do those with LO GAD. Onset groups were not found to differ with regard to social support provided by partners/spouses or by friends, nor in the quality of friendships maintained.

Table 8.4

Social Support Characteristics of EO and LO participants

	Early Onset (*N* = 24)		*Late Onset* (*N* = 52)		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Social support					
Children	79.2	(19)	55.8	(29)	$3.86_{[1]}$*
Spouse/partners	75.0	(18)	80.4	(41)	$0.28_{[1]}$
Friends	87.5	(21)	84.6	(44)	$0.11_{[1]}$
Quality of friendships					$0.31_{[1]}$
Acquaintances	37.5	(9)	44.2	(23)	
Confiding	62.5	(15)	55.8	(29)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

8.3.3 Health Characteristics

Age of onset and chronic disease in later life

As a group, 42 different current medical conditions were reported by participants. Descriptive statistics for the more commonly reported conditions are listed in Table 8.5. The most common medical conditions for both EO and LO groups included a pain syndrome, arthritis, high blood pressure, high cholesterol, and irritable bowel syndrome. A high percentage of both EO and LO groups reported wearing glasses for reading and/or long-distance vision. A series of χ^2 analyses were conducted to determine whether early-and late-onset groups differed with regards to medical comorbidity. Analyses were not performed between groups for conditions where there was a cell size of less than five (i.e. respiratory and endocrine/metabolic problems). Overall, EO and LO groups were found to be similar with respect to the frequency of current health conditions experienced by adults with late-life GAD. EO and LO participants reported an average of 3.7 (*S.D* = 2.6) and 4.5 (*S.D* = 2.8) medical conditions each. An independent-samples t-test revealed that, on average, onset groups did not differ in the total number of conditions reported ($t(74) = 1.23, p > .05$).

Table 8.5

Frequency of Current Medical Conditions Reported by EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
	f (%)	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Diseases of the nervous system	25.0	(6)	19.2	(10)	$0.33_{[1]}$
Headache	16.7	(4)	17.3	(9)	
Migraine	8.3	(2)	1.9	(1)	
Cardiac conditions	16.7	(4)	19.2	(10)	$0.07_{[1]}$
Congestive heart failure	4.2	(1)	3.8	(2)	
Pulmonary embolism	0.0	(0)	1.9	(1)	
Cardiac disease	8.3	(2)	3.8	(2)	
Sub-ventricular tachycardia (SVT)	0.0	(0)	3.8	(2)	
Enlarged heart	0.0	(0)	1.9	(1)	
Angina	8.3	(2)	3.8	(2)	
Hypertension	12.5	(3)	11.5	(6)	
High blood pressure	50.0	(12)	40.4	(21)	$0.62_{[1]}$
Respiratory disease	12.5	(3)	19.2	(10)	
Asthma	8.3	(2)	11.5	(6)	
Pneumonia	4.2	(1)	7.7	(4)	
Neoplasms	8.3	(2)	3.8	(2)	
Endocrine/ metabolic conditions	4.2	(1)	15.4	(8)	
Diabetes Type II	0.0	(0)	9.6	(5)	
Hypothyroidism	4.2	(1)	5.8	(3)	
High cholesterol	37.5	(9)	42.3	(22)	$0.16_{[1]}$
Digestive and gastrointestinal conditions	33.3	(8)	40.4	(21)	$0.35_{[1]}$
Constipation	4.2	(1)	7.7	(4)	
Irritable bowel syndrome (IBS)	25.0	(6)	15.4	(8)	
Reflux, oesophageal	4.2	(1)	23.1	(12)	
Stomach aches, pains and spasms	8.3	(2)	11.5	(6)	
Genito-urinary problems (urinary tract infection)	4.2	(1)	7.7	(4)	

$^{*}p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$

Table 8.5 – Continued

Frequency of Current Medical Conditions Reported by EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
	f (%)	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Any eye/ear conditions	12.5	(3)	19.2	(10)	$0.52_{[1]}$
Cataract	8.3	(2)	7.7	(4)	
Eye disease	8.3	(2)	13.5	(7)	
Problems with vision (use of glasses)	95.8	(23)	88.5	(46)	
Hearing loss	8.3	(2)	7.7	(4)	
Musculoskeletal/ connective tissue conditions	50.0	(12)	61.5	(32)	$0.90_{[1]}$
Arthritis	41.7	(10)	51.9	(27)	
Osteoporosis	12.5	(3)	7.7	(4)	
Back or spine issues (Including disc disorder, degeneration)	4.2	(1)	17.3	(9)	
Pain syndrome	41.7	(10)	63.5	(33)	$3.17_{[1]}$

Age of onset and current medication use

Frequency of current prescription and non-prescription medications used by early- and late-onset participants are presented in Table 8.6. A series of χ^2 frequency analyses were conducted to determine whether EO and LO groups differed with regards to use of prescription and non-prescription medications. Analyses were not performed between groups for conditions where there was a cell size of less than five (i.e. anticonvulsants and anti-inflammatory medications). The most commonly used prescription medications by both EO and LO groups were antidepressants, antihypertensives, anticoagulants, and hypolipidaemics, consistent with the most commonly reported medical conditions listed in Table 8.5. With regard to the use of psychotropic medications, rates of current antidepressant and/or anxiolytic use, excluding the use of benzodiazepines, were not found to significantly differ between onset groups. A significant χ^2 was however found for benzodiazepines at the .05 level, with benzodiazepine use being significantly greater amongst EO participants than LO participants. Onset groups were not found to significantly differ in the use of any other prescriptions medication.

The most commonly used non-prescription medications by both early-and late-onset participants were health supplements. A χ^2 frequency analysis found that EO participants were more likely than LO participants to use health supplements at the .05 significance level. Anti-reflux agents were used by about one-fifth of LO participants, though were not used by any EO participants. Whilst a χ^2 frequency analysis was not performed due to an expected cell count of less than 5 for the EO group, this result suggests that LO participants are more likely to use anti-reflux agents and this result should be considered as being potentially significant.

Table 8.6

Frequency of Current Prescription and Non-prescription Medications Used by EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	χ^2 [df]
Prescription medications					
Antidepressants	20.8	(5)	30.8	(16)	$0.81_{[1]}$
Benzodiazpines	29.2	(7)	9.6	(5)	$4.72_{[1]}$*
Antihypertensives	20.8	(5)	40.4	(21)	$2.79_{[1]}$
Anticoagulants	25.0	(6)	34.6	(18)	$0.70_{[1]}$
Anticonvulsants	4.2	(1)	9.6	(5)	
Anti-inflammatory	4.2	(1)	9.6	(5)	
Hypothyroid medications	4.2	(1)	5.8	(3)	
Hypolipidaemic	20.8	(5)	25.0	(13)	$0.16_{[1]}$
Hypoglycaemics	0	(0)	9.6	(5)	
Nicotinic analgesics	16.7	(4)	15.4	(8)	
Non-prescription medications					
Anti-reflux agents	0.0	(0)	21.2	(11)	
Anti-diarrhoeal	4.2	(1)	3.8	(2)	
Simple analgesics	8.3	(2)	13.5	(7)	
Health supplements	50.0	(12)	26.9	(14)	$3.89_{[1]}$*
Vitamins	29.2	(7)	19.2	(10)	
Minerals	16.7	(4)	15.4	(8)	
Folate	10.7	(3)	1.8	(1)	
Fish oil	33.3	(8)	5.8	(3)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Table 8.7 presents the total number of prescription and non-prescription medications used by participants per day. The mean alcohol consumption of EO and LO groups (i.e. number of drinks) per week is also presented in Table 8.7. Independent-samples t-tests revealed that onset groups did not differ in the number of prescription, non-prescription, or total number of medications (prescription and non-prescription) used. The EO group showed a trend towards greater substance (alcohol) use than the LO group however this difference was not found to be significant.

Table 8.7

Descriptive Statistics of Prescription and Non-prescription Medication Use by EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Prescription medication use	1.5	1.2	2.0	1.6	$1.23_{[74]}$
Non-prescription medications use	1.0	1.2	0.9	1.0	$0.69_{[74]}$
Total number of medications used (prescription and non-prescription)	2.5	2.1	2.8	2.0	$0.56_{[74]}$
Alcohol use	7.3	9.7	3.9	6.3	$1.86_{[74]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Age of onset and treatment history

Descriptive statistics for mean age at help-seeking, number of episodes and time since initial onset of anxiety for EO and LO groups are presented in Table 8.8. Table 8.8 also presents the results of independent-samples t-tests comparing onset groups on these variables. Levene's test for equality of variances was significant for the age at help-seeking and duration of illness variables. Accordingly, the t-values, degrees of freedom and p values reported for these variables were adjusted to account for heterogeneous variance. Independent-samples t-test revealed that onset groups did not differ in mean age at which they first sought help for a psychiatric problem. A significant difference was found between onset groups for mean number of episodes of psychiatric illness, with EO participants reporting a greater number of episodes on average. A significant difference was also found for time (in years) since onset of first DM-IV anxiety

disorder, with EO participants, on average, having a significantly longer history of anxiety than LO participants.

Significant differences were also found using a cut-off of 50 years. A significant between-group difference was found for mean age at help seeking (t (74) = 3.40, p < .001), with EO patients on average seeking help at 47.76 years (S.D = 15.0), and LO participants seeking help at 59.12 years (SD = 13.7). As with findings using a cut-off of 34, significant differences in the mean number of episodes of illness (t (74) = 5.95, p < .001) and duration of illness (t (73.99) = 7.71, p < .001) were also found.

Table 8.8

Help-seeking and Illness Characteristics of EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
Variable	*M*	*(SD)*	*M*	*(SD)*	$t_{[df]}$
Age at help seeking	48.3	(18.7)	54.9	(13.4)	$1.57_{[34.4]}$ †
Number of episodes	4.0	(1.2)	2.2	(1.2)	$6.03_{[74]}$***
Time since onset of first episode of anxiety (years)	46.8	(8.1)	14.5	(12.5)	$13.46_{[65.58]}$***†

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† equality of variances not assumed (Levene's test significant)

Descriptive statistics for psychiatric treatment variables for EO and LO participants are presented in Table 8.9. Differences in the frequency of psychiatric treatment previously sought were investigated using χ^2 frequency analyses. Overall, the two groups were similar with regard to psychiatric treatment history. No significant differences were found between the two onset groups in the proportion of participants who reported a history of counselling or psychotherapy, past psychotropic medication use, nor with regard to previous treatment of any kind.

Table 8.9

Descriptive Statistics of Psychiatric Treatment History for EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Treatment history					
History of counselling/ psychotherapy	29.2	(7)	17.3	(9)	$1.39_{[1]}$
History of psychotropic medication use	70.8	(17)	57.7	(30)	$1.20_{[1]}$
History of any treatment (therapy and/or medications)	79.2	(19)	63.5	(33)	$1.87_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

8.3.4 Age of onset and genetic or predisposing factors

Descriptive statistics for family history of a psychiatric illness for EO and LO participants are presented in Table 8.10. Investigation of differences between onset groups for a positive family history of a mood and/or affective disorder using χ^2 analyses revealed that EO participants were significantly more likely to have mothers with a history of psychiatric illness than LO participants. Onset groups did not differ with regard to frequency of psychiatric illness reported in the fathers of participants. EO participants were also found to report a family history of psychiatric illness in their 'parents' (mother and father combined) at a significantly higher rate than LO participants. Investigation of a family history of mental illness in the offspring of participants revealed no significant difference between onset groups.

Table 8.10

Frequency of EO and LO Participants Reporting a Family History of Psychiatric Illness

	Early Onset (N = 24)		*Late Onset (N = 52)*		*Significance test*
	f (%)	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Family history of emotional disorders					
Mother	75.0	(18)	34.6	(18)	$10.74_{[1]}$***
Father	20.8	(5)	15.4	(8)	$0.34_{[1]}$
Parents (mother and/or father)	83.3	(20)	36.5	(19)	$14.39_{[1]}$***
Children	45.8	(11)	42.3	(22)	$0.08_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

8.4 Discussion

Chapter Eight aimed to provide an overall description of the nature of the sample recruited, as well as to acquire an understanding of the aetiology late-life GAD in a group of community-dwelling anxious older adults distinguished by age at onset. Accordingly, potential differences in the demographic characteristics, health characteristics and genetic factors of a sample of older adults with EO and LO GAD were examined in the present chapter. Given the relationship between GAD and depression in late-life, and the observation that PD and panic symptomatology commonly co-occurred in a proportion of participants, the findings of the current investigation are discussed with reference to previous investigations of an onset distinction in late-life in the GAD, PD and MDD literature.

An examination of the age at onset characteristics revealed that participants reported a wide range of ages of onset, from young-old to old-old, indicative of the full range of ages at which generalized anxiety appears to be a problem in older Australian adults. An initial analysis of the age of onset characteristics revealed no differences between early- and late-onset groups in mean age at evaluation, or in age at onset of the presenting episode. This finding suggests that it was appropriate to compare the EO and LO samples, as they were of a similar age and had been suffering the current episode for an equivalent period of time. These findings are also consistent with previous investigations of late-life GAD (Beck, et al., 1996; Le Roux, et al., 2005; Lenze, et al., 2005) in which EO and LO groups of older adults were found to be similar with regard to current age and age at onset of the presenting disorder. By definition, the EO participants should have experienced their first anxiety disorder at a younger age than the LO participants. As expected, a significant between-group difference was found for age at onset of first DSM-IV disorder of any kind and for age at onset of first DSM-IV anxiety disorder, with mean age at onset of EO participants being significantly younger than that of LO participants at these time points.

It was hypothesised that early- and late-onset participants would be similar with respect to their demographic characteristics. The current findings revealed that the demographic characteristics of the two sub-samples of older adults did not found to differ from one another with respect to age, gender or marital status, nor in terms of education,

occupation, employment status, or employment intensity. These findings are in line with previous investigations of age at onset of GAD in later life (Beck, et al., 1996; Chou, 2009; Le Roux, et al., 2005; Lenze, et al., 2005) in that participants were typically female, married, and well-educated (i.e. had completed high school level education). Participants reported high levels of education and professional employment, which is in line with the available data of ACT residents (AIHW, 2003).

Analysis of social demographics revealed that EO and LO onset groups did not differ with regard to social support provided by participants' partner/spouse or by friends, nor in the quality of friendships maintained. A higher proportion of EO participants were however found to receive social support from their children than LO participants, although this finding was significant only at the .05 level. One explanation for this finding is that the children of older adults with EO GAD may have been raised in an environment in which one or both parents had a psychiatric illness and therefore they provided a supportive role from an early age which continues on throughout life. In contrast, older adults with LO GAD may previously have been independent and therefore did not use their children as a source of support when they were young. Furthermore, for many LO participants problems with anxiety may have developed after their children left home. As a result, the children of LO participants may not be as aware of their parents need for support, or be around to provide it. Aspects of social demographics have not previously been investigated in onset research and further research is required to investigate this relationship given the role of social support as a protective factor in the development of anxiety when exposed to stressful events (de Beurs, et al., 2000).

The hypothesis that EO and LO groups would be similar with regards to medical comorbidity as indicated by both the frequency of specific conditions reported and the total number of medical conditions overall was supported by the present data. The current findings are consistent with those of Chou (2009), who found similar rates of various cardiac conditions, stomach conditions and arthritis in a sample of older adults with early-and late onset GAD in late-life. The current findings are also in line with previous findings of Le Roux et al. (2005), who found no difference between groups of older adults with EO and LO GAD in mean number of medical conditions or in physical disability.

Although approximately 50% of the sample reported having one of a few conditions known to be common in later life (i.e. pain, cholesterol, high B.P, and musculoskeletal conditions), an overview of the frequency of other medical conditions reported by participants indicate that a relatively small proportion of the sample (i.e. about 25% or less) endorsed having any given condition, including those commonly associated with anxiety disorders. Similarly, the current sample of both EO and LO participants were overall not found to be high users of medication (see sections 7.2.3). Therefore, it may be that the sample of help-seeking older adults who volunteered for the present investigation had relatively good medical/physical health, raising the question as to whether healthier adults are more likely to self-refer to this kind of study. Although chronic health conditions are associated with anxiety in later life (van Zelst, 2003), the earlier finding that both EO and LO participants were similar in mean age at time of evaluation and at onset of the presenting episode suggests that the number of concurrent medical conditions reported is associated with the aging process itself, as opposed to age at onset and duration of anxiety.

The hypothesis that EO participants would be using psychotropic medications such as antidepressant medications and/or benzodiazepines at a higher rate than LO participants (hypothesis 4a) was partially supported by the current findings. Whilst current psychotropic medication use, excluding benzodiazepines, was not found to differ between onset groups, a significantly greater proportion of EO participants were found to be taking benzodiazepines than LO participants at the .05 significance level. These findings are in contrast to previous research by Le Roux et al. (2005) who found current psychotropic medication use by participants with EO GAD to be double that of LO GAD patients. In particular Le Roux et al. found that a higher proportion of LO patients were using benzodiazepines when compared to the EO group. Although the findings of Le Roux et al. led them to conclude that individuals who develop GAD in late life may receive less effective treatment for their illness than those with a longer history of anxiety, the current findings suggest that it is those with a longer history of anxiety that continue to use these less effective medications, whilst those with a more recent history are more likely to be prescribed newer SSRI treatments rather than benzodiazepines. The cut-off age used to compare onset groups does not appear to be a factor as to the difference between the present data and the findings of Le Roux et al. (2005), with the frequency of antidepressant use by EO and LO groups remaining similar when compared using a cut-off of 50 years. The finding that EO and LO groups were similar

in mean age at help-seeking for an emotional disorder (see section 8.2.3) may also account for the similar rates in use of mood stabilising medications in the current sample.

Hypothesis 4b proposed that EO participants would not differ from LO participants in their use of prescription and non-prescription medications. This hypothesis was partially supported by the current data. Although LO participants were observed to use the majority of prescription medications cited by the sample at higher rates than EO participants and to use a greater number of prescription medications overall, this finding was not significant. The finding that onset groups were similar with regard to prescription medication use is consistent with the finding of similar rates of significant medical conditions for which these medications were prescribed, including cardiac conditions, hypertension and cholesterol problems.

A comparison of non-prescription medication use revealed that early- and late-onset groups significantly differed in their use of health supplements at the .05 level, with a greater proportion of EO participants using health supplements than those with LO GAD. The use of anti-reflux agents was not statistically examined due to an expected cell count of less than five for the EO group. An analysis of the frequencies however suggests that LO participants (21.2%) are more likely to use anti-reflux agents than EO participants (0%), and that this result may warrant further investigation.

It is unknown why the frequency of health supplement use by participants in the EO group nearly doubled that of the LO group. Given that on average, EO participants delayed help-seeking until their late 40's despite a considerably earlier age of onset in most cases, and the relatively good physical health and low rates of medication use in general for this sample, it is possible that a proportion of participants primarily looked to alternative or 'natural' remedies to maintain good health and to address anxiety and other emotional problems. On the other hand, those people that develop health and emotional difficulties in later life may be more geared towards the medical model for solutions to health and emotional problems, and therefore less likely to consider 'natural' or 'herbal' remedies. Further investigation is required to establish this in future studies.

The hypothesis that EO participants would have higher rates of alcohol use than LO participants (Hypothesis 4c) was not supported by the current data. On average, although participants in the EO group consumed more alcohol per week than LO participants, this difference did not reach significance. Alcohol and substance use are common comorbid conditions in individuals with longstanding mental illness, and studies have shown that anxiety disorders are frequently preceded by another psychiatric condition such as mood disorders, or alcoholism (Merikangas, et al., 1998; Starcevic & Bogojevic, 1999; Starcevic, et al., 1993). As such, it is possible that alcohol may be used as a means to self-medicate by those with a long and chronic history of anxiety, which may account for the greater use of alcohol in the EO group. This is reflected in a statement by one participant identified as having EO anxiety who reported that "my panic attacks have reduced because I use alcohol to 'blunt' my feelings," and "I carry a coke bottle with a beer and brandy mix in my pocket... when I feel stressed or nervous, I have a nip of brandy and beer." The use of alcohol to manage problems with anxiety by some individuals in the EO group, along with increased alcohol use by this group on average may be a factor as to the delayed age at help-seeking for participants in the EO group (see Section 7.2.3) and similar rates in use of mood stabilisers between groups. Taken together, these findings suggest that the relationship between age of onset and alcohol use may warrant further investigation.

The hypothesis that EO participants would, on average, seek treatment at a younger age than LO participants (5a) was not supported by findings of the current investigation. On average, mean age at help-seeking for the EO group was 6.6 years earlier than participants in the LO group, though this difference was not significant. In contrast, using a cut-off 50 to compare onset groups, the EO group were found to seek help for emotional problems at a significantly younger age than those in the LO group. This finding may in part be due to the fact that those participants who were identified as belonging to the LO group based on a cut-off of 50 years had a much more recent onset relative to mean age at evaluation, and consequently had not previously sought help. On the other hand, those in the EO group had a greater number of episodes of psychiatric illness and lifetime history of anxiety in terms of time since onset of first episode, therefore prompting help-seeking at a much earlier age.

EO participants reported a significantly greater number of discrete episodes of anxiety and/or depression than LO participants, and time since onset of first anxiety episode in

the EO sample was also significantly greater than that of the LO group. These findings remained significant when groups were compared using a cut-off age of 50 years to distinguish onset groups, and are in support of hypotheses 5b and 5c, respectively. Findings of difference between EO and LO groups in duration since onset of illness and number of illness episodes are as expected given the much younger mean age at onset of first anxiety episode for EO participants, and are consistent with previous findings of late-life PD (Raj, et al., 1993) and GAD (Beck, et al., 1996; Le Roux, et al., 2005).

Hypothesis (5d) proposed that participants with EO GAD would report a history of both psychotropic use and counselling or psychotherapy at higher rates than those with LO GAD. This hypothesis was not supported by the data. Although a greater proportion of EO participants had a history of psychotropic treatment, had previously engaged in psychotherapy and had received treatment of either kind than LO participants, onset groups were not found to differ with regard to history of treatment sought for emotional problems. These findings are in line with previous findings of Le Roux et al. (2005), who found patients with EO GAD to have non-significantly higher rates of both a history of psychotropic medication use and a history of counselling or psychotherapy than those with LO GAD.

Investigation of genetic factors confirmed a higher prevalence of a positive family history of psychiatric illness in participants with EO GAD and is in partial support of Hypothesis 6. Specifically, a significantly higher proportion of EO participants reported their mothers to have a history of psychiatric illness than LO participants. Onset groups were not, however, found to differ with regard to the proportion of fathers or children reported to have a history of psychiatric illness. The relationship between genetic factors and age at onset of GAD has not previously been investigated however an association between EO of anxiety and increased familial risk for PD has been reported in previous investigations (Battaglia, et al., 1998; Battaglia, et al., 1995; Goldstein, et al., 1997; Segui, et al., 1999), in line with the current findings. Similarly, in a study of aging and panic disorder by Sheikh et al. (2004), 63% of older adults with EO PD were found to have a family history of anxiety, versus 39% of LO participants. This finding of difference was non-significant, however, is in support of findings of a greater association between EO GAD and a positive family history of anxiety in the present study and as reported in previous research.

In summary, the present data were in partial support of the hypotheses put forward. Early-and late-onset groups were homogenous in terms of demographic and health characteristics including both the type and number of health conditions reported, as predicted. As expected, EO participants were significantly younger at first onset of any DSM-IV disorder and first onset of a DSM-IV anxiety disorder. There was a small but significant finding for greater receipt of social support by the children of those with EO GAD. Hypothesised differences in participants' use of psychotropic medication were partially confirmed by the present data. Participants were found to be similar with regard to antidepressant use, however there was a small but significant finding for greater benzodiazepine use and the use of health supplements amongst those with EO GAD. Of note were the findings suggesting that participants with EO GAD tend to have a significantly longer course of illness characterised by a greater number of episodes of psychiatric illness, and that EO anxiety is related to a longstanding psychobiological (genetic) vulnerability to anxiety, as indicated by a positive family history of psychiatric disorders. Table 8.11 presents the variables on which onset groups were found to significantly differ in the investigation of the aetiological correlates of EO and LO GAD.

Table 8.11

Summary of Variables Found to Significantly Differ in the Aetiological Comparison of EO and LO Participants

Variables	*Direction of significance*
Age at first onset of any disorder (years)	EO < LO***
Age at onset of first anxiety disorder (years)	EO < LO***
Social support – Children	EO > LO*
Benzodiazepine use	EO > LO*
Health supplement use	EO > LO*
Anti – reflux medication use	LO > EO [a]
Time since onset of first episode of anxiety (years)	EO > LO***
Number of episodes	EO > LO***
Family history of emotional disorders	EO > LO***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

[a] Large difference, but χ^2 not performed

CHAPTER NINE

Phenomenological Comparisons of Early-onset and Late-onset GAD in Late-life

9.1 Introduction

As with previous findings regarding the aetiology of EO and LO anxiety disorders, findings relating to differences in the phenomenology of EO and LO anxiety disorders have also been mixed (Battaglia, et al., 1995; Goldstein, et al., 1997; Segui, et al., 1999; Sheikh, et al., 2004). Specifically, there is some literature suggesting differences between onset groups on subjective measures of GAD (Beck, et al., 1996; Le Roux, et al., 2005), whilst others suggest similarities on objective measures of GAD severity (Beck, et al., 1996; Hoehn-Saric, et al., 1993; Le Roux, et al., 2005). Limitations in past research as outlined in Chapter Three, as well as a lack of information regarding the relationship between age at onset and the phenomenology of GAD in older adults suggests the need for research that will add to our current understanding of this relationship. The current chapter therefore presents the findings of a study set out to empirically investigate the phenomenology of EO and LO GAD. Establishing phenomenological differences between EO and LO GAD patients could potentially have important treatment implications, and could also provide insights as to whether age of onset can influence an individuals' response to treatment.

The study presented in this chapter aimed to explore differences between onset groups across a number of phenomenological factors. These factors included rates of psychiatric comorbidity, indices of GAD-related symptom severity including responses on measures of psychopathology, and measures of health and functioning. The specific hypotheses examined in this investigation (hypotheses seven to nine) were previously outlined in Section 5.2.3 and Table 5.2 (see page 59).

9.2 Age of Onset and Psychiatric Comorbidity

Tables 9.1 through to 9.5 present the descriptive statistics for the primary and secondary (comorbid) psychiatric conditions of participants at assessment, at first onset of a DSM-IV disorder of any kind and first onset of a DSM-IV anxiety disorder of any kind.

9.2.1 Descriptive analysis of current psychiatric comorbidity

Psychiatric comorbidity at evaluation for both EO and LO participants is presented in Table 9.1. All EO participants met the criteria for a primary or principal diagnosis of GAD, whilst 94.2% of LO participants had a principal diagnosis of GAD. Of the LO participants not meeting criteria for a principal diagnosis of GAD, two had a principal diagnosis of PD and co-principal diagnosis of GAD, whilst one participant had a principal diagnosis of a phobic disorder (agoraphobia without a history of panic disorder) and a co-principal diagnosis of GAD. Over one-third of EO participants and approximately one-half of LO participants had a primary diagnosis of GAD without psychiatric comorbidity, with remaining participants meeting criteria for at least one other comorbid psychiatric condition.

Table 9.1

Frequency of Current and Comorbid Psychiatric Conditions for EO and LO Participants at Evaluation

	Primary Diagnosis			
	Early-Onset (N=24)	*Late Onset (N= 52)*		
	GAD	GAD	PD	Phobias
	(n = 24)	(n=49)	(n=2)	(n=1)
Secondary Diagnosis				
No Diagnosis	37.5% (9)	49.0% (24)		
GAD			3.8% (2)	1.9% (1)
PD	4.2% (1)	10.2% (5)		
Phobias	20.8% (5)	4.1% (2)		
OCD	4.2% (1)			
PTSD	8.3% (2)			
MDD single		6.1% (3)		
MDD recurrent	16.7% (4)	16.3% (8)		
PD symptomatology	8.3% (2)	14.3% (7)		

9.2.2 Descriptive analysis of psychiatric comorbidity at first onset of a DSM-IV disorder of any kind

Descriptive statistics for primary and secondary comorbid psychiatric conditions at first onset of a DSM-IV disorder of any kind for EO and LO participants are presented in Tables 9.2 and 9.3, respectively. The majority of EO participants met criteria for a primary diagnosis of GAD, with just over one-half of these participants meeting criteria for one or more comorbid psychiatric condition. Two participants met criteria for a primary diagnosis of both GAD and major depressive disorder (MDD) and one met criteria for both obsessive-compulsive disorder (OCD) and GAD. One EO participant had a primary diagnosis of post-traumatic stress disorder (PTSD), and did not meet criteria for any other disorder at that time.

Table 9.2

Frequency of Principal and Comorbid Psychiatric Conditions at First Onset of a DSM-IV Disorder of any kind for EO Participants (N = 24)

		Primary Diagnosis			
		GAD (n = 20)	OCD (n = 1)	PTSD (n = 1)	MDD single (n = 2)
Secondary Diagnosis	No diagnosis	45.0% (9)		100% (1)	
	GAD		100% (1)		100% (2)
	PD	5.0% (1)			
	Phobias	30.0% (6)			
	PTSD	5.0% (1)			
	MDD single	10.0% (2)			
	PD symptomatology	5.0% (1)			

Three-quarters of LO participants had a primary diagnosis of GAD, whilst three LO participants had a primary diagnosis of PD. Furthermore, one participant each had a primary diagnosis of a phobia, recurrent MDD, and 'other,' respectively. Seven LO participants had a primary diagnosis of MDD, single episode. Of the LO participants meeting criteria for a primary diagnosis of GAD, just over one-half did not meet criteria for an additional DSM-IV diagnosis. The remaining LO participants met criteria for one or more comorbid psychiatric condition, the most common being a single episode of MDD, followed by panic symptomatology. Participants with primary diagnoses of PD,

phobias and MDD 'single episode' also met criteria for GAD, whilst those with a recurrent episode of MDD and 'other', did not meet criteria for any other disorder.

Table 9.3

Frequency of Principal and Comorbid Psychiatric Conditions at First Onset of a DSM-IV Disorder of any kind for LO Participants (N = 52)

		Primary Diagnosis				
	GAD (n = 39)	PD (n = 3)	Phobias (n = 1)	MDD single (n = 7)	MDD recurrent (n = 1)	Other (n = 1)
No Diagnosis	56.4% (22)	66.7% (2)		57.1% (4)	100% (1)	100% (1)
GAD		33.3% (1)	100% (1)	14.3% (1)		
PD	5.1% (2)			14.3% (1)		
Phobias	2.6% (1)					
OCD	2.6% (1)					
MDD single	23.1% (9)					
PD symptoms	10.3% (4)					
Other				14.3% (1)		

Secondary Diagnosis

9.2.3 Descriptive analysis of psychiatric comorbidity at first onset of a DSM-IV anxiety disorder

Descriptive statistics for primary and secondary comorbid psychiatric conditions for EO and LO participants at first onset of a DSM-IV anxiety disorder are presented in Tables 9.4 and 9.5 respectively. Nearly all of the EO participants met the criteria for GAD as the primary concern. One participant each met criteria for OCD and PTSD as the issue of primary concern, although both of these participants additionally met criteria for GAD. Of the participants with a primary diagnosis of GAD, nine did not meet criteria for any other disorder, with remaining participants meeting criteria for one or more comorbid psychiatric condition, the most common being a major depressive episode.

Table 9.4.

Frequency of Principal and Comorbid Psychiatric Conditions for EO participants at First Onset of a DSM-IV Anxiety Disorder (N = 24)

		Primary Diagnosis		
		GAD (n = 22)	OCD (n = 1)	PTSD (n = 1)
Secondary Diagnosis	No diagnosis	40.9% (9)		
	GAD		100% (1)	100% (1)
	Panic Disorder	4.5% (1)		
	Phobias	27.3% (6)		
	PTSD	4.5% (1)		
	MDD Single	18.2% (4)		
	PD symptomatology	4.5% (1)		

The majority of LO participants also had a principal diagnosis of GAD, with almost two-thirds of these participants not meeting criteria for an additional DSM-IV diagnosis. As with the frequency of comorbid conditions at first onset of a DSM-IV disorder of any kind, MDD was the most common comorbid psychiatric condition among participants with a primary diagnosis of GAD. Six participants had principal diagnoses of PD, four of whom also met criteria for GAD and one met criteria for a primary diagnosis of both a phobic disorder and GAD.

Table 9.5.

Frequency of Principal and Comorbid Psychiatric Conditions at First Onset of a DSM-IV Anxiety Disorder for LO Participants (N = 52)

		Primary Diagnosis		
		GAD (n = 45)	PD (n = 6)	Phobias (n = 1)
Secondary Diagnosis	No Diagnosis	64.4% (29)	33.3% (2)	
	GAD		66.7% (4)	100% (1)
	PD	6.7% (3)		
	Phobias	2.2% (1)		
	OCD	2.2% (1)		
	MDD Single	13.3% (8)		
	PD symptomatology	11.1% (5)		

Descriptive statistics for participants meeting diagnostic criteria for one or more comorbid psychiatric condition at time of evaluation, at first onset of a DSM-IV disorder of any kind, and at first onset of a DSM-IV anxiety disorder are presented in Table 9.6. A χ^2 frequency analysis revealed that onset groups presented with similar rates of psychiatric comorbidity at all three time periods, with over one-half of EO participants and about one-third of LO participants presenting with psychiatric comorbidity at each of these assessment points.

Table 9.6

Descriptive Statistics for Psychiatric Comorbidity at Current and Past Episodes of Illness Onset for EO and LO participants

	Early Onset (N = 24)		*Late Onset (N = 52)*		*Significance Test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Comorbid psychiatric condition at presentation	54.2	(13)	40.4	(21)	$1.26_{[1]}$
Comorbid psychiatric condition at time of 1st DSM-IV diagnosis	54.2	(13)	34.6	(18)	$2.60_{[1]}$
Comorbid psychiatric condition at time of 1st onset of GAD	58.3	(14)	36.5	(19)	$3.17_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

In contrast to the findings presented in Table 9.6, an investigation of differences in psychiatric comorbidity using a cut-off of 50 revealed a significant difference between onset groups, presented in Table 9.7. Based on this cut-off to distinguish onset groups, EO participants were found to be significantly more likely to present with psychiatric comorbidity than LO participants at evaluation, at first onset of a DSM-IV disorder of any kind, and at first onset of a DSM-IV anxiety disorder.

Table 9.7

Descriptive Statistics for Psychiatric Comorbidity at Current and Past Episodes of Illness Onset for EO and LO Participants Using a Cut-off Age of 50 Years (N = 76)

	Early Onset (N = 42)		*Late Onset (N = 34)*		*Significance Test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Comorbid psychiatric condition at presentation	57.1	(24)	29.4	(10)	$5.84_{[1]}$*
Comorbid psychiatric condition at time of 1st DSM-IV diagnosis	57.1	(24)	20.6	(7)	$10.40_{[1]}$***
Comorbid psychiatric condition at 1st onset of GAD	57.1	(24)	26.5	(9)	$7.19_{[1]}$**

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

9.3 Age of Onset and Indices of GAD Phenomenology

9.3.1 Frequency of GAD-related worries

Descriptive statistics for the frequency of current worries reported by EO and LO participants are presented in Table 9.8. A series of χ^2 frequency analyses were conducted to determine whether EO and LO groups differed with regard to topics of current worry. Analyses revealed that onset groups were similar with regard to frequency of worry about timeliness, work, family, finances, social interactions, the health of themselves and others, and community and world affairs.

Table 9.8

Frequency of Current GAD-related Worries Reported by EO and LO Participants

	Early-Onset (N = 24)		*Late-Onset (N = 52)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Timeliness, punctuality	75.0	(18)	78.8	(41)	$0.14_{[1]}$
Work/ Education	41.7	(10)	28.8	(15)	$1.22_{[1]}$
Family	95.8	(23)	92.3	(48)	$0.33_{[1]}$
Finance	54.2	(13)	51.9	(27)	$0.03_{[1]}$
Social/ interpersonal interactions	70.8	(17)	50.0	(26)	$2.90_{[1]}$
Health (self)	66.7	(16)	82.7	(43)	$2.43_{[1]}$
Health (significant others)	79.2	(19)	76.9	(40)	$0.05_{[1]}$
Community/ world affairs	50.0	(12)	50.0	(26)	$0.00_{[1]}$

* $p \leq 0.05$; ** $p \leq 0,01$; *** $p \leq 0.001$

9.3.2 Severity of GAD-related worries

Descriptive statistics for mean severity of current worries as rated on a nine-point scale from zero to eight for EO and LO participants are presented in Table 9.9. Overall the two groups appear similar with respect to severity of worry for each of the worry domains. Comparison of means using independent-samples t-tests were performed to investigate differences between early- and late-onset groups on mean ratings of worry severity. Analyses revealed no significant differences between groups in severity of worry about timeliness, work, family, finances, or social interactions, nor were groups found to differ in severity of worry about their own health, the health of significant others, or about community/world affairs.

Table 9.9

Mean Severity of GAD-related Worries for EO and LO Participants

	Early-Onset (N = 24)		*Late-Onset (N = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Timeliness/ punctuality	4.9	3.2	5.1	2.9	$-0.35_{[74]}$
Work/ Education	2.8	3.4	2.1	3.4	$0.76_{[74]}$
Family	6.5	2.2	6.12	2.2	$0.50_{[74]}$
Finances	3.3	3.3	3.0	3.2	$-0.32_{[74]}$
Social/ interpersonal interactions	4.3	3.0	3.1	3.2	$1.45_{[74]}$
Health (self)	3.8	3.1	5.1	2.8	$-1.74_{[74]}$
Health (significant others)	5.2	3.0	5.0	3.1	$0.33_{[74]}$
Community/ world affairs	3.6	3.7	3.0	3.2	$0.77_{[39.40]}$ †

$^{*}p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$

† equality of variances not assumed (Levene's test significant)

9.3.3 Frequency of GAD-related symptoms

Descriptive statistics for the frequency of current GAD symptoms reported by EO and LO participants are presented in Table 9.10. The majority of both EO and LO participants reported experiencing all symptoms, consistent with a current diagnosis of GAD. χ^2 frequency analyses conducted to investigate differences between EO and LO participants' experience of GAD symptoms revealed onset groups to be similar with

respect to the experience of GAD symptomatology. Although a greater proportion of EO participants reported feelings of irritability, this difference was not found to be significant. No significant differences were found between EO and LO participants in the frequency of symptoms including restlessness, fatigue, difficulty concentrating, or muscle tension, nor was there a significant difference in reports of sleep disturbance.

Table 9.10

Frequency of Current GAD Symptoms Reported by EO and LO Participants

	Early-Onset (*N* = 24)		*Late-Onset* (*N* = 52)		*Significance test*
Variable	*f* (%)	(*n*)	*f* (%)	(*n*)	$\chi^2_{[df]}$
Irritability	79.2	(19)	65.4	(34)	$1.48_{[1]}$
Restlessness, feeling keyed up or on edge	100.0	(24)	96.2	(50)	$0.95_{[1]}$
Being easily fatigued	83.3	(20)	84.6	(44)	$0.02_{[1]}$
Difficulty concentrating or mind going blank	87.5	(21)	94.2	(49)	$1.02_{[1]}$
Muscle tension	91.7	(22)	90.4	(47)	$0.03_{[1]}$
Difficulty falling asleep/ staying asleep/ unsatisfying sleep	91.7	(22)	82.7	(43)	$1.07_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

9.3.4 Severity of current GAD-related symptoms

Descriptive statistics for mean severity of current GAD symptoms for EO and LO participants are presented in Table 9.11. On average, EO participants rated the experience of symptoms of restlessness and/or feelings of being keyed up or on edge as significantly more severe than those with LO GAD at a .01 level. Comparison of means using independent-samples t-tests revealed no significant differences between onset groups in the severity of other symptoms including irritability, fatigue, difficulty with concentration, muscle tension, or sleep disturbance.

Table 9.11

Mean Severity of GAD -related Symptoms for EO and LO Participants

	Early-Onset (N = 24)		*Late-Onset (N = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Irritability	4.7	2.7	4.4	3.0	$0.39_{[74]}$
Restlessness, feeling keyed up or on edge	6.9	1.1	6.0	1.5	$2.75_{[74]}$**
Being easily fatigued	5.2	2.6	5.2	2.5	$-0.07_{[74]}$
Difficulty concentrating or mind going blank	5.5	2.4	5.6	1.9	$-0.35_{[74]}$
Muscle tension	6.2	2.2	6.2	1.9	$0.03_{[74]}$
Difficulty falling asleep/ staying asleep/ unsatisfying sleep	6.0	2.2	5.6	2.5	$0.61_{[74]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

9.3.5 Interference and distress associated with GAD-related symptoms, percentage of time spent worrying and interviewer-rated severity of GAD

Descriptive statistics for mean severity of GAD-related interference, distress, mean percentage of time spent worrying each day, and mean interviewer-rated severity of GAD for EO and LO participants are presented in Table 9.12. Both the level of interference in participants lives due to symptoms of GAD and distress associated with current symptoms of GAD were rated on a scale of zero to eight (0 = "no interference/no distress"; 8 = "very severe interference/distress."). A comparison of means using independent-samples t-tests revealed that EO and LO groups did not differ with regard to interference ratings, with interference due to GAD symptoms being rated as "moderate to severe" by both EO and LO participants. On average, distress associated with current GAD-related symptoms significantly differed between onset groups at the .01 level, with EO participants rated as being significantly more distressed than LO participants, equal variance not assumed. Independent-samples t-tests also revealed that on average, participants in the EO group spent a significantly greater percentage of time worrying each day than those in the LO group at the .05 level. As with findings using a cut-off of 34 years, investigation of time spent worrying using a

cut-off of 50 years revealed that participants with EO GAD spent a significantly greater percentage of time worrying per day, on average, than those in the LO group (51.8% vs. 46% respectively) (t (74) = 2.63, $p < .05$). Interviewer-rated severity of GAD was also rated using a 9-point scale (where 0 = "none" and 8 = "very severely disturbing/disabling"). With regard to overall severity of GAD, those in the EO group had a significantly greater interviewer-rated severity score of GAD than those with LO GAD at a .001 level.

Table 9.12

Descriptive Statistics for Percentage of Time Spent Worrying, Interference, Distress and Interviewer-rated Severity of GAD for EO and LO participants

	Early-Onset (N = 24)		*Late-Onset (N = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Interference due to current symptoms/worry	5.7	1.3	5.2	1.4	$1.40_{[74]}$
Distress associated with current symptoms/worry	7.1	0.8	6.4	1.2	$2.71_{[62.35]}$**†
Percentage of day spent worrying (%)	57.9	18.7	45.2	22.7	$2.40_{[74]}$*
Interviewer-rated severity of GAD	6.8	1.0	5.9	1.0	$3.99_{[74]}$***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† Equality of variances not assumed (Levene's test significant)

9.3.6 Measures of psychopathology

Descriptive statistics for scores on self-report measures of pathology for EO and LO participants are presented in Table 9.13. Comparison of means using independent-samples t-tests were performed to examine the differences in scores on these scales between EO and LO groups. No difference was found between groups on a measure of anxiety as assessed by the GAI, nor in the severity of symptoms of depression, as measured by the GDS-15. Onset groups were also found to be similar with respect to scores on measures of pathological worry, trait anxiety, anxiety sensitivity, perceived control over anxiety-related events, and both general and social self-efficacy.

Table 9.13

Descriptive Statistics for Scores on Measures of Anxiety, Worry, Depression, Trait Anxiety, Anxiety Sensitivity, Perceptions of Anxiety Control and Self-efficacy for EO and LO participants (N = 71)

	Early-Onset (*n= 21*)		*Late-Onset* (*n = 50*)		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
The Geriatric Anxiety Inventory	12.48	4.80	12.66	5.07	$0.14_{[69]}$
The Penn State Worry Questionnaire	62.14	11.05	59.56	9.87	$0.97_{[69]}$
The Geriatric Depression Scale -15	4.71	3.47	4.79	3.23	$0.10_{[74]}$
The State-Trait Anxiety Inventory – Trait scale	49.71	10.05	50.26	9.32	$0.22_{[69]}$
The Anxiety Sensitivity Index	32.10	12.46	29.62	13.75	$0.71_{[69]}$
The Anxiety Control Questionnaire	71.00	17.24	70.51	17.63	$0.11_{[69]}$
The Self Efficacy Scale (SES)					
Generalised self-efficacy (GSE)	54.76	13.94	53.06	9.77	$0.59_{[69]}$
Social self-efficacy (SSE)	18.14	5.04	18.54	3.80	$0.36_{[69]}$

9.4. Age of Onset and Measures of Health and Functioning

9.4.1 Age of onset and Self perceived health

Descriptive statistics for mean ratings of self-perceived health for early-and late-onset groups are presented in Table 9.14. Independent-samples-t-tests were conducted to compare early- and late-onset groups on self-perceived health ratings. On average, based on a 5-point scale (1 = poor health; 5 = excellent heath), EO participants rated their general health to be better than those with LO GAD at a .05 level of significance. When asked to rate their current health as compared to one year ago on a 5-point scale (1 = 'much worse'; 3 = about the same'; 5 = 'much better'), there was no significant difference between onset groups, with both EO and LO participants rating their health to be "about the same," on average.

Table 9.14

Descriptive Statistics of Self-perceived Health for EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Self perceived health					
General health	3.6	0.9	3.1	1.0	$2.14_{[74]}$*
Current health compared to 12 months ago	3.1	0.7	2.9	0.9	$0.66_{[74]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

9.4.2. Functional limitations

Descriptive statistics for functional limitations reported by EO and LO participants across a range of activities of daily living are presented in Tables 9.15 and 9.16 respectively. The majority of EO participants reported 'no limitations at all' in vigorous, moderate or light activity, as well as in activities of daily living such as stair climbing, bending or kneeling, and bathing and dressing. One-fifth of EO participants reported to be 'limited a little' in vigorous activities. Just under one- tenth of EO participants reported being 'limited a little' in moderate activities, in climbing stairs, and in kneeling or bending.

Table 9.15

Frequency of Functional Limitations in Activities of Daily Living for EO Participants

Early Onset (N = 24)			
Functional limitations	Not at all limited	Limited a little	Limited a lot
	f % (n)	*f % (n)*	*f % (n)*
Vigorous activity	70.8 (17)	20.8 (5)	8.3 (2)
Moderate activity	91.7 (22)	8.3 (2)	0.0
Light activity	100.0 (24)		
Limitations in climbing stairs	91.7 (22)	8.3 (2)	
Limitations in bending or kneeling	91.7 (22)	8.3 (2)	
Limitations in bathing, dressing	100.0 (24)		

In Table 9.16 it can be seen that just under one-half of the LO participants reported no limitations in vigorous or moderate activity, and about one-third reported to be 'limited a little'. About one-quarter of LO participants reported to be 'limited a lot' in vigorous activities due to their current health and physical condition. The majority of LO participants reported no limitations at all in light activities, whilst just under two-fifths reported being 'limited a little' by light activities. Three-quarters of LO participants reported no limitations in stair climbing and two-thirds reported no limitations in bending or kneeling, whilst around one-fifth reported being 'limited a little' in these activities. A small proportion reported being 'limited a lot' in performing these activities. The majority of LO participants had no limitations in activities of daily living such as bathing and dressing.

Table 9.16

Frequency of Functional Limitations in Activities of Daily Living for LO Participants

	Late Onset (N = 52)		
Functional limitations	Not at all limited	Limited a little	Limited a lot
	f % (n)	*f % (n)*	*f % (n)*
Vigorous activity	42.3 (22)	34.6 (18)	23.1 (12)
Moderate activity	50.0 (26)	40.4 (21)	9.6 (5)
Light activity	82.7 (43)	17.3 (9)	
Limitations in climbing stairs	75.0 (39)	19.2 (10)	5.8 (3)
Limitations in bending or kneeling	65.4 (34)	23.1 (12)	11.5 (6)
Limitations in bathing, dressing	92.3 (48)	7.7 (4)	

A Principal Component Analysis (PCA) was run with the six variables measuring functional limitations. Prior to performing PCA, the suitability of data for factor analysis was assessed. Although the overall sample size is considered to be small, it is in keeping with the recommended ratio of ten cases per item to be factor analysed (Nunnally, 1978; Tabachnick & Fidell, 2007), which is considered to be adequate for this analysis. Inspection of the correlation matrix revealed all coefficients to be above 0.3. The Kaiser-Meyer-Olkin value was 0.84, exceeding the recommended value of 0.6 (Kaiser, 1970, 1974: cited in Pallant, 2011) and Bartlett's Test of Sphericity (Bartlett,

1954: cited in Pallant, 2011) reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis revealed a one factor solution with an eigenvalue of 4.19, accounting for 69.9% of the variance. An inspection of the screeplot revealed a clear break after the first component. Using Catell's (1966) scree test, a decision was made to retain this component for further investigation. Table 37 displays the factor loadings for each item. Reliability analysis of these variables yielded a Cronbach's alpha of 0.89. This finding was not surprising in that it indicated that participants reporting a limitation in one type of activity were likely to report some limitation in others. Similarly, participants who reported 'no limitations' in a given activity were in general also likely to report not having limitations in other types of activities. Following findings of a one factor solution for items measuring functional limitations and high reliability amongst these items, these variables were combined to form one 'functional limitations' score. An independent-samples t-test comparing means was run using this new score to investigate whether early-and late-onset groups differed with regard to functional disability. Analyses revealed a significant difference between EO and LO groups, with participants in the LO group reporting greater functional limitations than EO participants, using Levene's Test for equality of variance (t (73.77) = 3.78, $p < .001$).

Table 9.17

Rotated Components Matrix for Functional Limitations for EO and LO Participants

Functional limitation	Component 1
Vigorous activity	.813
Moderate activity	.862
Light activity	.838
Limitations in climbing stairs	.857
Limitations in bending or kneeling	.913
Limitations in bathing and dressing	.719

9.5 Discussion

Indices of GAD- related phenomena and measures of psychopathology were assessed in the present study in order to investigate the phenomenology of early- and late-onset GAD in late-life. The present study firstly aimed to examine the relationship between EO and LO GAD and psychiatric comorbidity. Second, it sought to investigate the relationship between age at onset and GAD severity by examining differences in both the frequency and severity of GAD-related worries reported by EO and LO participants, and the frequency and severity of GAD-related symptoms endorsed by participants. The study further aimed to determine the severity of interference and distress associated with the experience of current GAD symptoms amongst EO and LO participants, in addition to time (percentage of day) spent worrying by early-and late-onset groups. The study additionally sought to determine whether EO and LO groups of older adults with a principal or co-principal diagnosis of GAD differed in response to clinical measures of depression, general anxiety, worry, trait anxiety, anxiety sensitivity, self efficacy and locus of control, and intended to confirm previous findings of interviewer-rated severity of GAD by examining the overall interviewer-rated severity of GAD. Finally, the study aimed to investigate the relationship between age at onset of GAD and both self-perceived health and functional limitations.

The hypotheses that EO participants would have higher rates of psychiatric comorbidity than LO participants at evaluation (7a); at first onset of a DSM-IV disorder of any kind (7b); and at first onset of a DSM-IV anxiety disorder were not supported by the current data. These findings are consistent with those of Sheikh et al. (2004) who, using a cut-off of 35 years to distinguish between onset groups, found no difference between groups of older adults with EO and LO PD for comorbidity with current major depression and dysthymia or past major depression, social phobia, simple phobia, GAD, and agoraphobia. Based on a cut-off of 34 years, the current findings are in contrast to previous findings of age at onset of GAD and psychiatric comorbidity (Chou, 2009; Le Roux, et al., 2005). Group comparisons of the current data using a cut-off age of 50, however, revealed that a significantly greater proportion of the EO group met criteria for one or more comorbid psychiatric conditions at evaluation, at first onset of a DSM-IV disorder of any kind, and at first onset of a DSM-IV anxiety disorder. Although the findings of Le Roux et al. (2005) are limited to the assessment of current rather than lifetime psychiatric comorbidity, the current findings using a cut-off age of 50 support

the previous findings of Le Roux and colleagues who, also using a cut-off of 50 to distinguish onset groups, found that EO GAD patients were significantly more likely to report psychiatric comorbidity than LO patients. Similarly, using a cut-off of 50, Chou (2009) found those with EO GAD to be significantly more likely to report comorbidity than those with LO GAD.

This difference in findings of comorbidity based on the different cut-off ages used may in part be due to the fact that when using a cut-off of 50, those participants who were identified as belonging to the LO group had a much more recent onset of a psychiatric illness, with the presenting episode also being the first episode of psychiatric illness for many of these participants. On the other hand, those in the EO group had a greater number of episodes of psychiatric illness and a greater lifetime history of anxiety in terms of time since the onset of their first episode (see Chapter Eight). Previous studies of comorbidity have found that the prior existence of any anxiety disorder increases the risk for subsequent development of MDD and other comorbid conditions, with the strongest risk attributable to previous GAD (Hettema, et al., 2006; Kessler, et al., 1996). As such, the fact that EO participants' have had a longer history of anxiety than LO participants, with more subsequent episodes of psychiatric illness when distinguished by a cut-off of 50 years rather than the 34-year cut-off, may account for the finding that EO participants are significantly more likely to present with comorbidity when using this later cut-off age.

The current data revealed that EO and LO groups of older adults with either a principal or co-principal diagnosis of GAD did not differ with respect to the frequency or severity of GAD-related worries reported, supporting hypothesis 8a. These results are supported by previous research (Beck, et al., 1996) in which older adults with early-and late-onset GAD were found to be similar with regards to severity of worry about finances, health, and social concerns. The observation of a trend towards greater frequency and severity of worry about social interactions amongst EO participants in the current sample, in line with previous findings (Beck et al, 1996) that older adults with EO GAD scored non-significantly higher than those with LO GAD on the social subscale of the worry scale (WS: Wisocki, et al., 1986), suggests that worry about social interactions may be a particular concern for older adults whose onset of GAD occurs earlier in life.

The finding that, on average, those in the LO group rated worry about health as more severe than those in the EO subgroup is in contrast to previous findings of Beck et al. (1996), who found a trend towards greater severity of worries about health in the EO vs. LO group, though this difference was not significant. Apart from this early investigation of the characteristics of GAD in older adults by Beck and Colleagues (1996), no other investigation has examined differences in the frequency or severity of GAD-related worries in older adults with early- and late-onset anxiety with which to compare the current findings. Overall, the current findings are in support of previous research indicating that EO and LO groups of older adults do not differ with regard to the frequency or severity of GAD-related worries.

Hypothesis 8b proposed that there would be no difference between early-and late-onset participants in the frequency and severity of GAD symptoms reported. With the exception of significantly greater severity of "restlessness and/or feelings of being keyed up or on edge" for EO participants, onset groups were not found to differ in the frequency or severity of GAD symptoms outlined in Criterion C of the DSM-IV. Although differences in the frequency and/or severity of GAD-related symptoms in EO and LO groups of older adults has not been previously examined, the current findings are consistent with a previous investigation of age at onset of GAD in a middle aged sample (Hoehn-Saric, et al., 1993), in which patients with onset in childhood or adolescence were not found to differ with regards to symptoms of anxiety from those who had an onset after 20 years of age. Based on their findings Hoehn-Saric and colleagues (1993) concluded that once GAD is developed, the anxiety symptoms become similar in the two groups.

Previous investigations of an onset distinction in late-life (PD) further lend support to the current findings. For example, in an investigation of the clinical characteristics of PD in a sample of older adults, Raj and colleagues (1993) found that the symptoms experienced during panic attacks were similar for both EO and LO patients. Based on their findings, Raj and colleagues (1993) concluded that the data showed few differences between EO and LO panic in terms of phenomenology, suggesting that the two subtypes are not different disorders. This finding is consistent with those of Sheikh et al. (2004), who found that the number of panic symptoms endorsed and the severity of panic did not differ between onset groups in a sample of older adults with PD. Overall, the current findings are consistent with previous investigations of symptom

severity in older adults with early-and late-onset anxiety. In line with the above conclusions of Hoehn-Saric et al. (1993), given that participants in both the early-and late-onset subgroups had GAD symptomatology for a number of years, it is unlikely that age at onset is central to symptom severity in older adults with clinical levels of anxiety.

The hypothesis that EO and LO participants would be similar in their experience of interference, distress or percentage of time spent worrying as a result of GAD symptoms (8c) was only partially supported by the current findings. Onset groups were not found to differ in the severity of interference associated with GAD symptoms, with both onset groups rating interference, on average, to be "moderately severe." The finding that early-and late-onset groups were similar with regard to severity of interference is in line with the findings reported in Chapter Eight that onset groups were similar with regard to current rates of employment and the level of education attained. Although onset groups were similar in their experience of interference to daily life as a result of GAD, EO participants were found to be significantly more distressed as a result of GAD than those with LO GAD.

Distress due to symptoms of GAD has not previously been examined in investigations of an onset distinction; however, the current findings are consistent with previous investigation of onset and late-life anxiety in the panic literature. In an investigation of late-life PD, Sheikh et al. (2004) found patients with EO PD to have significantly greater distress in response to cognitions and feelings during panic attacks for those with EO PD. It is unclear as to why participants with EO GAD in late life experience greater distress due to symptoms of GAD than those with LO, despite both onset groups being similar with regard to symptom severity for the majority of GAD-related symptoms. It is possible that distress may be related to participants' history of GAD with respect to duration of anxiety since initial onset and the number of clinically significant episodes experienced, both of which are greater for the EO group. Consequently, it may be that a history of untreated or recurring GAD for which there may seem to be no reprieve for those with EO of anxiety may contribute to the increased distress observed in the EO group. Further investigation is required to establish this however.

Group comparisons of the percentage of time spent worrying each day revealed that on average, participants with EO anxiety spent a significantly greater amount of time worrying than those in the LO group. As with levels of 'distress' due to GAD, although there are no previous investigations with which to compare the current findings, it may be that percentage of time spent worrying is also related to the duration of anxiety. As such, those with a longer history of anxiety may tend to worry more than those with a more recent history, as observed. It may also be that this increased worry amongst EO participants contributes to the increased distress they experience.

EO participants were found to have significantly greater interviewer-rated severity of GAD than those with LO GAD, as predicted (hypothesis 8d). This finding is supported by previous findings (Beck, et al., 1996; Le Roux, et al., 2005). It is interesting to note that this has been consistently found across past research (Beck et al., 1996; Le Roux et al., 2005), despite differences in the cut-off age used to distinguish onset groups. As with distress associated with GAD, it may be that a lifelong history of anxiety symptoms that may wax and wane over time though have not subsided, in addition to a greater number of clinically significant episodes of anxiety for those with EO of anxiety (see Chapter Eight) may contribute to the increased severity of GAD observed in these individuals, and the subsequent rating of this.

The hypothesis that EO and LO participants would not differ in mean scores on self-reported measures of anxiety, worry, depression, trait anxiety, anxiety sensitivity, perceptions of control over anxiety-related events and self-efficacy (hypothesis 8e), was supported by the current findings. The current findings are partially supported by previous research (Beck et al., 1996; Le Roux et al., 2005). Although Beck and colleagues found EO GAD patients to have significantly higher trait anxiety scores on the STAI-T, and were rated as more depressed on the Hamilton Rating Scale for Depression (HRSD: Hamilton, 1960) compared with those in the LO sample, onset groups were found to be similar with regard to scores on the STAI-S, PSWQ, HARS, and the BDI. Similarly, whilst Le Roux and colleagues found older adults with EO GAD to report more excessive and uncontrollable worry than those with LO GAD as measured by the PSWQ (Meyer, et al., 1990), early-and late-onset groups did not differ on scales that assessed anxiety more broadly and included somatic symptoms such as the Beck Anxiety Inventory (BAI: Beck, et al., 1988) or the Hamilton Rating Scale for Anxiety (HAM-A: Hamilton, 1959), nor did they differ on a measure of depressive

symptoms (BDI: Beck, et al., 1961). Findings of similarity between onset groups in the phenomenology of late-life anxiety are further supported by the PD literature (Sheikh et al., 2004), which has found older adults with early- and late-onset PD to be similar with respect to scores on the BAI, the Agoraphobic Cognitions Questionnaire (ACQ) and the BDI. It is interesting to note that although the EO group were found to report a significantly greater percentage of time spent worrying than those in the LO group, onset groups were not found to differ on the PSWQ, an overall measure of pathological worry. This finding is in line with that of Barlow, Rapee, & Brown (1992), who found the PSWQ to be unrelated to reported percentage of the day spent worrying in a clinical GAD sample.

Hypothesis 9a, that perceptions of health would be significantly worse amongst those with LO GAD than those with EO GAD was supported by the current findings. When asked about perceptions of 'current health compared to one year ago', both onset groups reported their health to be 'about the same,' on average. Perceptions of general health, however, were found to significantly differ. On average, self-perceived health at assessment was found to be significantly worse for LO participants than for those in the EO group. The current research is in line with recent findings of Chou (2009), who found that amongst those with lifetime GAD, LO participants were significantly more likely to report poor self-rated health than those with EO GAD. The current findings are not supported by those of Le Roux et al. (2005) who found early-and late-onset groups with late-life GAD to be similar with respect to self-rated health.

Aside from the investigation by Le Roux and colleagues (2005) and more recently Chou (2009), no other investigation of an onset distinction has examined self-perceived health as a measure of health and functioning. As previously noted, anecdotally a number of LO participants experienced changes in physical health such as a knee replacement for one participant, and recovery from a broken foot for another prior to the onset of their current episode of GAD. Accordingly, it is possible that such changes in one's physical health that require lengthy recovery or that may alter one's health condition and subsequent functioning may contribute to the poorer perception of current health observed in the LO group as compared to the EO group.

A significant difference between groups was found on a measure of functional limitations, with participants in the LO group reporting greater limitations in activity due to physical health than those with EO anxiety. The current data is in support of the hypothesis that LO anxiety is associated with greater functional limitations (Hypothesis 9b), and is consistent with previous investigations of late-life anxiety (Chou, 2009; Le Roux et al., 2005) that have found individuals with LO of GAD to report significantly more limitations/poorer role functioning due to physical problems than those with EO GAD. This finding led Le Roux and colleagues (2005) to suggest that disability may be a risk factor for the development of GAD in later life.

The current findings, in line with those of Le Roux et al., (2005) and Chou (2009) are consistent with those of Beekman et al. (1998), who suggest that functional impairment is more strongly associated with anxiety than disease. Further, in a review of the relationship between late-life anxiety, depression and physical disability, Lenze, et al. (2001) draw a distinction between physical disability, or impairment in the performance of basic or instrumental activities of daily living, and role disability, or inability to carry out important social or occupational functions. Accordingly, Le Roux et al. (2005) conclude that their results suggest that LO GAD is associated with role disability, but not necessarily with physical disability. The present data appear to be in line with this distinction and the suggestion by Le Roux and colleagues that LO anxiety may be associated with role disability but not physical disability given that the present investigation revealed no differences between onset groups on a number of health conditions (see Chapter Eight); the overall prevalence of each medical condition was relatively low; and that onset groups did not differ in the severity of 'interference' to daily life as a result of GAD, despite the LO group being found to report greater functional limitations.

9.6 Conclusions

In summary, the present data suggest that there are some phenomenological aspects of late-life GAD that are distinguished by age of onset. Table 9.18 summarises the phenomenological differences that were found between onset groups. Expected differences in psychiatric comorbidity were not supported by the current data using a cut-off of 34 years of age, but were confirmed using a cut-off of 50, in line with

previous research. The severity of the symptom 'restlessness and/or feelings of being keyed up or on edge' was found to be significantly greater for participants with EO GAD than for those with LO GAD. Participants with EO of GAD were also found to experience greater distress due to symptoms of GAD, to spend a significantly greater proportion of the day worrying and to have greater interviewer-rated severity of GAD than LO participants, whilst those with LO GAD were found to have poorer self-perceived health and to report greater functional limitations than those with EO GAD. Percentage of time spent worrying and distress are indices of phenomenology that have not previously been examined in the onset literature and may represent different facets of phenomenology that require further investigation. Findings regarding interviewer rated-severity, on the other hand, have consistently been found across previous research. As such, it may be that whilst onset groups cannot be discerned with respect to the frequency and severity of specific GAD symptoms, they can be with respect to overall GAD severity and in measures of health and functioning.

Table 9.18

Summary of Variables found to significantly differ in the Phenomenological Comparison of EO and LO Participants

Variables	Direction of Significance
GAD symptom severity - Restlessness/keyed up	EO > LO**
Percentage of day spent worrying (%)	EO > LO*
Distress associated with current GAD symptoms/worry	EO > LO**
Interviewer-rated severity of GAD	EO > LO***
Self-perceived health - General health	LO > EO*
Functional limitations	LO > EO***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

CHAPTER TEN

An Investigation of the Relationship between Negative Life Events and Symptoms of Anxiety and Depression in Older adults with Early-and Late-onset GAD

10.1 Introduction

Chapter Ten presents the investigation of Research Questions (RQ) 4 and 5, both of which sought to examine the relationship between age of onset and negative life events. Previous literature indicates that adverse life events can occur at a relatively high rate in older adults and can be serious in nature (e.g., death of a loved one, reduced finances, personal illness, or legal difficulties) (Hughes, et al., 1988). These and other such experiences including experiences of loss, severe illness of self or others, relational stress and experiences of sudden unexpected events have been found to be related to the onset of depression in later life (Kendler, Hettema, Butera, Gardner, & Prescott, 2003; Kraaij, et al., 2002; Kraaij & de Wilde, 2001; Orrell & Davies, 1994). Despite research indicating that stressful life events also precede episodes of anxiety disorders (Faravelli, 1985; Faravelli & Pallanti, 1989; Finlay-Jones & Brown, 1981), relatively little is known about the relationship between stressful life events and anxiety, and even less so about this relationship in older adults (Kendler, et al., 2003). Drawing upon the diathesis-stress model outlined in Chapter Four (See Section 4.2) and previous empirical evidence suggesting that environmental precipitants may play a more important role in the onset of LO GAD than in EO GAD, Research Question 4 aimed to investigate the relationship between age of onset and the frequency and severity of stressful life events preceding the onset of anxiety amongst older adults with EO and LO GAD. The hypotheses put forward to investigate this relationship are outline in Table 5.3 (See Chapter Five). Section 10.2 of this chapter therefore presents the empirical examination of hypotheses 10a – 10e.

Research Question 5 aimed to explore the relationship between age of onset and the experience of negative life events across the lifespan and symptoms of psychopathology amongst older adults with early- and late- onset GAD. As outlined in Chapter Four, whilst there is some literature regarding the relationship between negative life events and depressive symptoms, knowledge about the relationship between negative life

events and late-life anxiety, particularly in relation to an onset distinction represents a gap in the research literature. As such, it was not possible to put forward informed hypotheses regarding this research question. Rather, a number of exploratory research questions were put forward in Table 5.4 (see Section 5.2.5), that were designed to investigate this relationship. Sections 10.3 - 10.8 therefore present the findings of this investigation.

10.2 Frequency and Severity of Stressful Negative Life Events Preceding the Onset of Psychopathology in Older Adults with Early- and Late-onset GAD

10.2.1 Examination of hypothesis 10a: The frequency of stressful life events preceding the onset of the presenting episode of GAD

Descriptive statistics for the frequency of stressful life events reported to precede the onset of the presenting episode of GAD by EO and LO participants are presented in Table 10.1. A series of χ^2 frequency analyses were conducted to investigate differences between EO and LO groups in the frequency of stressful life events preceding the onset of the presenting episode of GAD. No significant differences were found between onset groups in the frequency of stressful events involving family and/or relationships, occupation and/or education, finances, personal health and/or the health of significant others, or with regard to the experience of 'other' stressful events preceding onset of the presenting episode.

Table 10.1
Frequency of Stressful Life Events Preceding Onset of the Presenting Episode of GAD for EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
	f (%)	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Difficulty in family or relationships	45.8	(11)	42.3	(22)	$0.08_{[1]}$
Difficulty in occupation or education	41.7	(10)	50.0	(26)	$0.46_{[1]}$
Difficulty with finances	16.7	(4)	36.5	(19)	$3.07_{[1]}$
Difficulty or changes in health of self or others	70.8	(17)	57.7	(30)	$1.20_{[1]}$
[a] Other stressful events	50.0	(12)	42.3	(22)	$0.39_{[1]}$

[a] Includes changes in residence/relocation, changes in living conditions, changes in recreation or social activities, and children leaving the home

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

10.2.2 Examination of hypothesis 10b: The severity of stressful life events preceding the onset of the presenting episode of GAD

Descriptive statistics for the mean severity of stressful life events experienced by EO and LO participants preceding the onset of the presenting episode of GAD are presented in Table 10.2. Comparison of means using independent-samples t-tests revealed that onset groups did not significantly differ in the mean severity of events experienced involving family or other significant relationships, education or occupation, financial circumstances, health-related events, or in the severity of 'other' stressful events. On average, onset groups were also found to be similar with regard to the total number of stressful events reported to precede the onset of the presenting episode of GAD.

Table 10.2

Mean Severity of Stressful Life Events Preceding the Onset of the Presenting Episode of GAD by EO and LO Participants

	Early Onset (N = 24)		*Late Onset (N = 52)*		*Significance Test*
Variable	*M*	*S.1 SD*	*M*	*SD*	$t_{[df]}$
Difficulty in family or relationships	1.4	2.0	1.4	1.9	$0.06_{[74]}$
Difficulty in occupation or education	0.9	1.4	1.3	1.5	$1.09_{[74]}$
Difficulty with finances	0.3	0.8	0.7	1.0	$1.85_{[55.45]}$ †
Difficulty or changes in health of self or others	1.0	0.8	0.9	0.9	$0.26_{[74]}$
Other stressful events	1.3	1.5	1.0	1.3	$0.96_{[74]}$
Total number of life events preceding onset of current episode	2.1	0.8	2.3	1.2	$0.71_{[63.54]}$ †

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† equality of variances not assumed (Levene's test significant)

10.2.3 Examination of hypothesis 10c: The frequency of stressful life events preceding first onset of GAD

Descriptive statistics for the frequency of stressful life events reported to precede first onset of GAD for EO and LO participants are presented in Table 10.3. χ^2 frequency analyses conducted to investigate differences between early-and late-onset participants revealed that onset groups did not significantly differ with regard to the frequency of stressful events involving family or significant relationships, occupation and/or education, or 'other' stressful event prior to episode onset. A significant difference was found between groups in the frequency of events involving financial circumstances at a .05 level and health-related events at a .01 level, with a significantly greater proportion of LO participants reporting these events to precede first onset of GAD than EO participants.

Table 10.3

Frequency of Stressful Life Events Preceding First Onset of GAD EO and LO Participants

	Early onset (N=24)		*Late onset (N = 52)*		*Significance test*
	f (%)	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Difficulty in family or relationships	50.0	(12)	48.1	(25)	$0.02_{[1]}$
Difficulty in occupation or education	54.2	(13)	48.1	(25)	$0.24_{[1]}$
Difficulty with finances	8.3	(2)	28.8	(15)	$3.98_{[1]}$*
Difficulty or changes in health of self or others	16.7	(4)	48.1	(25)	$6.87_{[1]}$**
Other stressful events	37.5	(9)	36.5	(19)	$0.01_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

10.2.4 Examination of hypothesis 10d: The severity of life events preceding first onset of GAD

Descriptive statistics for the mean severity of stressful life events experienced by EO and LO participants preceding first onset of GAD are presented in Table 10.4. Comparison of means using independent-samples t-tests were performed to examine between-group differences in the mean severity of stressful events preceding first onset of GAD. Levene's test for equality of variances was highly significant for the difficulty in occupation or education variable, the difficulty with finances variable and the difficulty or changes in the health of self or others variable. Accordingly, t-values, degrees of freedom, and significance values reported for these variables are based on Levene's test of equality. A significant difference was found between onset groups in the severity of events relating to education or occupation, and for health-related events at the .01 level. A significant difference was also found between onset groups for financial circumstance at the .05 level. No significant differences were found between onset groups in the severity of stressful events involving family and/or significant relationships, or in 'other' events, nor were onset groups found not to differ with regard to the total number of stressful life events reported to precede first onset of GAD.

Table 10.4

Mean Severity of Stressful Life Events Preceding First Onset of GAD for EO and LO Participants

	Early Onset (N = 24)		*Late Onset (N = 52)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Difficulty in family or relationships	1.3	1.8	1.7	2.1	$0.91_{[74]}$
Difficulty in occupation or education	0.6	0.7	1.5	1.8	$3.14_{[73.12]}$** †
Difficulty with finances	0.2	0.6	0.6	0.9	$2.31_{[66.76]}$* †
Difficulty or changes in health of self or others	0.2	0.6	0.7	0.8	$2.73_{[59.34]}$** †
Other stressful events	1.1	1.6	0.9	1.4	$0.45_{[74]}$
Total number of life events preceding onset of anxiety episode	1.7	0.9	2.1	1.1	$1.65_{[74]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† Equality of variances not assumed (Levene's test significant)

10.3 Examination of Exploratory Research Question 1: The Prevalence of Negative Life Events in Older Adults with Early-and Late-onset GAD

The percentage of EO and LO participants who experienced one or more event per cluster, in each of the four developmental periods and across the life span are presented in Tables 10.5 and 10.6, respectively. Ninety-five percent of both EO and LO respondents experienced at least one negative life event during childhood. During adulthood and late-adulthood, all participants in both onset groups experienced one or more negative life event. In the year prior to the interview, the majority of both EO and LO participants experienced at least one negative event.

All older adults with EO GAD had experienced the death of a significant other, as did all but one participant with LO GAD. Approximately one-fifth of both EO and LO participants reported the death of a significant other during childhood and in the year prior to the interview, with the majority of participants reporting the death of a significant other in adulthood or late-adulthood. Over four-fifths of both early-and late-onset participants reported that they had had a severe illness at some point in their life, with the highest percentage of participants reporting this to have occurred in adulthood and late adulthood respectively. The majority of EO and LO participants had experienced a significant other having a severe illness at some point throughout life, with a high percentage of EO participants having experienced a severe illness of someone close in all four developmental periods. Again, the highest percentage of participants reported this experience to occur during adulthood and late adulthood.

Negative socio-economic circumstances were reported mainly during childhood and adulthood for both EO and LO participants. Few financial problems were reported by EO participants in the later stages of their life, although about one-third of LO participants still reported such difficulties in late-adulthood. Approximately nine percent of EO participants and eight percent of LO participants reported that they had been sexually abused during their life. Approximately one-half of older adults with early-and late-onset anxiety reported that they had been victims of physical abuse. Participants of both onset groups primarily experienced physical abuse in childhood and adulthood. Emotional abuse and neglect was reported by over four-fifths of EO participants, and three-quarters of LO participants. This form of abuse was mainly reported to occur during childhood and middle adulthood.

Just over one-half of EO participants had experienced events related to crime/disaster/war (CDW). These were mainly reported in adulthood and late adulthood, represented by the periods of World War II and the Vietnam War. Over two-thirds of LO participants experienced events related to CDW. These were mainly reported to occur in adulthood and late adulthood for LO participants. Throughout life, stress associated with relationships with friends, family and significant others were reported by all participants. Relational stress was reported at high rates in all developmental periods by both EO and LO respondents. Finally, the majority of EO and LO participants reported experiencing problem behaviours of significant others throughout life. Most of the older adults reported experiencing these difficulties during adulthood and late-adulthood, particularly those with EO of GAD.

Table 10.5

Percentage of Participants with EO GAD who Experienced One or more Event per Negative Life Event Cluster (N = 21)

	Childhood (0 – 15 years)		Adulthood (16 – 49 years)		Late adulthood (50 years to past year)		12 months prior to interview (past year)		Throughout life	
Event cluster	*%*	*(n)*	*%*	*(n)*	*%*	*(n)*	*%*	*(n)*	*%*	*(n)*
Death of significant others	19.0	(4)	76.2	(16)	61.9	(13)	19.0	(4)	100.0	(21)
Severe illness – self	28.6	(6)	61.9	(13)	71.4	(15)	33.3	(7)	90.5	(19)
Severe illness – others	76.2	(16)	95.2	(20)	90.5	(19)	76.2	(16)	100.0	(21)
Socio-economic circumstances	38.1	(8)	61.9	(13)	23.8	(5)	14.3	(3)	61.9	(13)
Sexual abuse	4.8	(3)	9.5	(2)	0.0	(0)	0.0	(0)	9.5	(2)
Physical abuse	52.4	(11)	38.1	(8)	4.8	(1)	4.8	(1)	52.4	(11)
Emotional abuse/neglect	80.9	(17)	61.9	(13)	33.3	(7)	23.8	(5)	85.7	(18)
Crime/disaster/war	9.5	(2)	38.1	(8)	28.6	(6)	0.0	(0)	52.4	(11)
Stress with relationships	81.0	(17)	100.0	(21)	90.5	(19)	61.9	(13)	100.0	(21)
Problem behaviour of significant others	38.1	(8)	85.7	(18)	71.4	(15)	52.4	(11)	85.7	(18)
Total	95.2	(20)	100.0	(21)	100.0	(21)	95.2	(20)	100.0	(21)

Table 10.6

Percentage of Participants with LO GAD who Experienced One or more Event per Negative Life Event Cluster (N = 48)

	Childhood (0 – 15 years)		Adulthood (16 – 49 years)		Late adulthood (50 years to past year)		12 months prior to interview (past year)		Throughout life	
Event cluster	*%*	*(n)*	*%*	*(n)*	*%*	*(n)*	*%*	*(n)*	*%*	*(n)*
Death of significant others	18.8	(9)	77.1	(37)	79.2	(38)	20.8	(10)	97.9	(47)
Severe illness – self	14.6	(7)	50.0	(24)	60.4	(29)	45.8	(22)	83.3	(40)
Severe illness – others	50.0	(24)	87.5	(42)	81.2	(39)	64.6	(31)	93.8	(45)
Socio-economic circumstances	37.5	(18)	56.2	(27)	31.2	(15)	18.8	(9)	66.7	(32)
Sexual abuse	4.2	(2)	4.2	(2)	2.1	(1)	2.1	(1)	8.3	(4)
Physical abuse	45.8	(22)	27.1	(13)	0.0	(0)	0.0	(0)	45.8	(22)
Emotional abuse/neglect	56.2	(27)	56.2	(27)	31.2	(15)	16.7	(8)	75.0	(36)
Crime/disaster/war	18.8	(9)	41.7	(20)	25.0	(12)	2.1	(1)	70.8	(34)
Stress with relationships	68.8	(33)	97.9	(47)	77.1	(37)	56.2	(27)	100.0	(0)
Problem behaviour of significant others	29.2	(14)	58.3	(28)	56.2	(27)	20.8	(10)	70.8	(34)
Total	95.8	(46)	100.0	(48)	100.0	(48)	87.5	(42)	100.0	(0)

10.4. Examination of Exploratory Research Question 2: The Relationship between Negative Life Events per Developmental Period and Symptoms of Psychopathology in Late-life amongst Participants with EO and LO GAD

Pearson product-moment correlation coefficients were computed using the dichotomy cluster scores to assess the relationship between negative life events in each of the four developmental periods and symptoms of psychopathology in late-life. The relationships between negative life events (as measured by the Negative Life Events Questionnaire) and scores on measures of anxiety, worry and depression for participants with EO and LO GAD are presented in Tables 10.7 and 10.8, respectively. Due to the sample size of the LO group being larger than that of the EO sample, correlations for the LO sample were not required to be as large as those for the EO group to reach significance. The .05 significance level for the EO sample (n = 21) was reached at r = .42, and at r = .29 for the larger LO sample (n = 48). Therefore, correlations in the EO sample that would be considered significant with a sample size of 48 were also noted in Table 10.7 for comparability purposes.

10.4.1 The relationship between negative life events per developmental period and symptoms of psychopathology in late-life amongst EO participants

A strong, negative correlation was found between the experience of CDW events in childhood and scores on both measures of pathological worry and trait anxiety in late-life. Strong negative correlations were also found between the experience of severe illness of a significant other in late adulthood and scores on measures of depression and anxiety sensitivity in late-life. Negative socio-economic circumstances and CDW events in late adulthood both correlated positively with trait anxiety in late-life. There was a moderately strong correlation between problem behaviour of significant others in late adulthood and anxiety symptoms in late-life, as measured by the GAI. The experience of negative life events in adulthood and in the year prior to the interview were not correlated with any symptoms of psychopathology in late life for participants with EO GAD.

Table 10.7

Relationship between Negative Life Events per Developmental Period (dichotomy score) and Symptoms of Psychopathology amongst Participants with EO GAD (N = 21)

Event cluster per developmental period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Death of significant others – childhood	-.087	-.345^	-.195	-.023	-.307^
Death of significant others – adulthood	-.197	.184	.063	.128	.201
Death of significant others – late adulthood	.163	-.006	.084	-.126	.183
Death of significant others – 12 months prior to interview	.082	-.111	-.246	-.234	-.149
Severe illness (self) – childhood	-.153	-.134	-.116	.247	-.338^
Severe illness (self) – adulthood	-.093	.030	-.146	.071	-.093
Severe illness (self) – late adulthood	-.051	.253	.064	.215	-.331^
Severe illness (self) – 12 months prior to interview	-.126	.057	.012	.063	-.029
Severe illness (others) – childhood	-.160	-.264	-.276	-.106	-.275
Severe illness (others) – adulthood	-.167	.348^	.237	.351^	.216
Severe illness (others) – late adulthood	-.501*	-.143	-.136	.046	-.490*
Severe illness (others) – 12 months prior to interview	-.193	.076	.090	.254	-.083

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^ Correlation considered significant with a sample size of N = 48

Table 10.7 – continued

Relationship between Negative Life Events per Developmental Period (dichotomy score) and Symptoms of Psychopathology in Participants with EO GAD (N = 21)

Event cluster per developmental period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Socio-economic circumstances – childhood	-.208	.056	.147	.309^	.200
Socio-economic circumstances – adulthood	-.283	-.295^	-.056	.271	-.098
Socio-economic circumstances – late adulthood	-.094	.210	.348^	.521*	-.012
Socio-economic circumstances – 12 months prior to interview	-.118	.084	.231	.391^	-.072
Sexual abuse – childhood	.022	-.015	.117	.007	-.002
Sexual abuse – adulthood	-.030	-.153	.027	.093	.039
Sexual abuse – late adulthood	–	–	–	–	–
Sexual abuse – 12 months prior to interview	–	–	–	–	–
Physical abuse – childhood	-.213	-.364^	-.003	.028	-.369^
Physical abuse – adulthood	-.165	-.098	.240	.080	-.073
Physical abuse – late adulthood	.022	-.015	.117	.007	-.059
Physical abuse – 12 months prior to interview	.022	-.015	.117	.007	-.059

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^ Correlation considered significant with a sample size of N = 48

Table 10.7

Relationship between Negative Life Events per Developmental Period and Symptoms of Psychopathology in EO Participants

Event cluster per developmental period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Emotional abuse/neglect – childhood	-.285	.154	.174	.104	-.149
Emotional abuse/neglect – adulthood	-.053	-.021	.032	.226	-.033
Emotional abuse/neglect – late adulthood	-.209	-.006	-.029	.101	-.137
Emotional abuse/neglect – 12 months prior to interview	-.173	.127	.221	.264	-.088
Crime/disaster/war – childhood	.011	-.015	-.517*	-.621**	-.059
Crime/disaster/war – adulthood	.327^	.290	.117	.007	.245
Crime/disaster/war – late adulthood	.092	-.088	.371	.469*	.200
Crime/disaster/war – 12 months prior to interview	_	_	-.203	-.046	_
Relational stress – childhood	-.329^	-.351^	-.215	-.109	-.003
Relational stress – adulthood	-.402^	-.149	-.141	-.041	.200
Relational stress – late adulthood	-.177	.178	.339^	.019	.039
Relational stress – 12 months prior to interview	-.205	-.016	-.020	.250	.233
Problem behaviour of significant others – childhood	-.123	-.091	.212	-.051	-.222
Problem behaviour of significant others – adulthood	-.397^	-.357^	-.355^	-.203	-.273
Problem behaviour of significant others – late adulthood	-.037	-.445*	-.188	-.234	-.092
Problem behaviour of significant others – 12 months prior to interview	.148	-.179	.087	.216	.114

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^ Correlation considered significant with a sample size of N = 48

10.4.2 The relationship between negative life events per developmental period and symptoms of psychopathology in late-life for LO participants.

Moderately strong correlations were found between sexual abuse events in childhood and high scores on measures of trait anxiety and anxiety sensitivity in late-life. In addition, a moderately strong, positive correlation was found between problem behaviours of significant others experienced in childhood and trait anxiety in late-life. Negative socio-economic circumstances and sexual abuse in adulthood were positively correlated with trait anxiety and anxiety sensitivity in late-life amongst participants with LO GAD. CDW events and relational stress in adulthood were significantly correlated with symptoms of worry and depression, respectively.

Severe personal illness and negative socio-economic circumstances in late adulthood were both positively correlated with trait anxiety in late-life. Significant positive correlations were found between the experience of severe personal illness in the year prior to the interview and symptoms of anxiety, depression, trait anxiety and anxiety sensitivity amongst LO participants in late-life. Negative socio-economic circumstances in the year prior to interview were positively correlated with depressive symptoms in late-life, whilst CDW events in the year prior to interview were positively associated with anxiety sensitivity in late-life. Finally, a positive correlation was found between experiences of problem behaviour of significant others in the year prior to interview and anxiety symptoms in late-life.

Table 10.8

Relationship between Negative Life Events per Developmental Period (dichotomy score) and Symptoms of Psychopathology amongst Participants with LO GAD (N = 48)

Event cluster per developmental period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Death of significant others – childhood	.261	.126	.046	.094	.210
Death of significant others – adulthood	.039	.028	.023	-.111	.150
Death of significant others – late adulthood	-.260	-.046	-.084	-.110	-.020
Death of significant others – 12 months prior to interview	-.028	.010	.015	.023	.091
Severe illness (self) – childhood	-.234	.050	-.031	.034	.022
Severe illness (self) – adulthood	.183	.061	.052	.250	.151
Severe illness (self) – late adulthood	.285	.184	.077	.431**	.265
Severe illness (self) – 12 months prior to interview	.479**	.316*	.117	.441**	.338*
Severe illness (others) – childhood	.064	.156	-.021	.241	.146
Severe illness (others) – adulthood	.104	-.091	-.073	.108	.122
Severe illness (others) – late adulthood	.145	.192	-.075	.098	.209
Severe illness (others) – 12 months prior to interview	-.045	-.055	-.136	-.062	-.047

* $p \leq 0.05$; ** $p \leq 0.01$; ***$p \leq 0.001$

Table 10.8 – continued

Relationship between Negative Life Events per Developmental Period (dichotomy score) and Symptoms of Psychopathology amongst Participants with LO GAD (N = 48)

Event cluster per developmental period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Socio-economic circumstances – childhood	.021	.057	.035	.187	.050
Socio-economic circumstances – adulthood	.041	.231	.068	.307*	.362*
Socio-economic circumstances – late adulthood	.217	.020	.069	.394**	.283
Socio-economic circumstances – 12 months prior to interview	.297*	.122	.159	.281	.277
Sexual abuse – childhood	-.048	.207	.262	.361*	.363*
Sexual abuse – adulthood	-.063	.207	.211	.324*	.308*
Sexual abuse – late adulthood	-.083	.206	.105	.217	.095
Sexual abuse – 12 months prior to interview	-.216	.001	-.154	-.117	-.242
Physical abuse – childhood	.105	.019	.043	.264	.225
Physical abuse – adulthood	-.126	.088	.073	.229	-.162
Physical abuse – late adulthood	–	–	–	–	–
Physical abuse – 12 months prior to interview	–	–	–	–	–

* $p \leq 0.05$; ** $p \leq 0.01$; ***$p \leq 0.001$

Table 10.8

Relationships between Negative Life Events per Developmental Period and Symptoms of Psychopathology amongst LO Participants

Event cluster per developmental period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Emotional abuse/neglect – childhood	.212	-.081	-.049	-.043	-.170
Emotional abuse/neglect – adulthood	.078	-.114	-.071	.033	-.017
Emotional abuse/neglect – late adulthood	.283	-.010	-.121	.061	-.036
Emotional abuse/neglect – 12 months prior to interview	.276	-.201	-.206	-.026	-.014
Crime/disaster/war – childhood	.019	.049	.108	.195	.138
Crime/disaster/war – adulthood	-.086	.283	.291*	.112	.134
Crime/disaster/war – late adulthood	-.268	-.202	-.109	-.200	-.030
Crime/disaster/war – 12 months prior to interview	-.038	.147	.186	.267	.291*
Relational stress – childhood	-.027	.036	.079	.190	.166
Relational stress – adulthood	.357*	-.233	-.143	-.012	-.080
Relational stress – late adulthood	.213	-.121	-.156	.111	.114
Relational stress – 12 months prior to interview	.201	.021	-.016	.062	.151
Problem behaviour of significant others – childhood	.027	.170	.129	.399*	.126
Problem behaviour of significant others – adulthood	.033	.052	-.076	.090	.076
Problem behaviour of significant others – late adulthood	.131	-.151	-.200	-.011	-.015
Problem behaviour of significant others – 12 months prior to interview	.132	.342*	.239	.249	.215

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

10.5. Examination of Exploratory Research Question 3: The Relationship between the Total Number of Negative Life Events (from each event cluster) throughout Life and Symptoms of Psychopathology in Late-life amongst Participants with EO and LO GAD

Pearson product-moment correlation coefficients were computed using the quantity cluster scores to investigate the bivariate relationship between the occurrence of negative life events from each event cluster throughout life and symptoms of psychopathology in late-life. The relationship between the total number of life events experienced throughout life and symptoms of psychopathology for EO and LO participants are presented in Tables 10.9 and 10.10 respectively. Once again, due to the LO sample being larger than the EO sample, correlations in the EO sample that would be considered significant with a sample size of 48 were noted in Table 10.9 for comparability purposes.

10.5.1 The relationship between the total number of negative events throughout life and symptoms of psychopathology amongst older adults with EO GAD

Findings for the EO group revealed only one event cluster to be significantly correlated with scores on a measure of psychopathology in late-life. Specifically, a moderately strong, positive correlation was found between the experience of negative socio-economic circumstances throughout life and trait anxiety in late-life. Three negative correlations were noted that would have been deemed significant had the EO sample size (n = 21) been the same as the LO sample size (n = 48). These related to severe illness of others and relational stress with the GDS-15 and problem behaviour of significant others with the GAI.

Table 10.9

Relationship between the Total Number of Life Events throughout Life (quantity score) and Symptoms of Psychopathology amongst Participants with EO GAD (N = 21)

Event cluster (throughout life)	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Death of significant others	-.040	-.026	-.031	-.066	.118
Severe illness – self	-.150	.143	-.059	.259	-.281
Severe illness – others	-.352^	.062	.021	.229	-.179
Socio- economic circumstances	-.229	-.017	.186	.462*	-.006
Sexual abuse	.000	-.086	.093	.051	.089
Physical abuse	-.167	-.216	.147	.052	-.223
Emotional abuse/ neglect	-.204	.040	.060	.176	-.122
Crime/disaster/war	.127	.058	.179	.139	.059
Relational stress	-.393^	-.114	-.027	.026	-.220
Problem behaviour of significant others	-.204	-.441^	-.190	-.128	-.188
Total number of events	-330^	-.096	.051	.210	.-.208

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

^ Correlation considered significant at.05 level with a sample size of N = 48

10.5.2 The relationship between the total number of negative events throughout life and symptoms of psychopathology amongst older adults with LO GAD

Amongst the LO group, there was a strong and significant positive correlation between experiences of severe personal illness throughout life and trait anxiety in late-life, and moderate, positive correlations between severe personal illness and both anxiety sensitivity and depression in late-life. Negative socio-economic circumstances throughout life were positively correlated with trait anxiety and anxiety sensitivity in late-life. There was a moderate, positive correlation between experiences of sexual abuse throughout life and both trait anxiety and anxiety sensitivity in late-life. There was also a significant positive correlation between relational stress throughout life and depression in late-life. The remaining six event clusters were not found to correlate significantly with any symptoms of psychopathology in late-life. The total number of events of all types throughout life was significantly correlated with both trait anxiety and anxiety sensitivity in late-life.

Table 10.10

Relationship between the Total Number of Life Events throughout Life (quantity score) and Symptoms of Psychopathology amongst Participants with LO GAD (N = 48)

Event cluster (throughout life)	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Death of significant others	-.022	.049	-.010	-.090	.204
Severe illness – self	.337*	.255	.100	.495***	.331*
Severe illness – others	.056	.021	-.147	.058	.093
Socio- economic circumstances	.202	.176	.119	.441***	.390**
Sexual abuse	-.102	.236	.225	.353*	.307*
Physical abuse	-.008	.056	.061	.264	.270
Emotional abuse/ neglect	.259	-.074	-.108	.029	-.087
Crime/disaster/war	-1.03	.214	.287	.214	.220
Relational stress	.286*	-.138	-.070	.099	.085
Problem behaviour of significant others	.105	.090	-.029	.195	.114
Total number of events	.271	.100	-.004	.349*	.325*

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

10.6. Examination of Exploratory Research Question 4: The Relationship between the Total Number of Negative Life Events Experienced per Developmental Period and Symptoms of Psychopathology in Late life

Pearson product-moment correlation coefficients were computed using the quantity period scores to examine the bivariate relationships between the total number of all life events experienced in each developmental period and symptoms of psychopathology in late-life. The relationship between the total quantity of negative life events experienced in each of the developmental periods and symptoms of psychopathology for EO and LO groups is presented in Tables 10.11 and 10.12 respectively. As with the above investigations, correlations in the EO sample that would be considered significant with a sample size of 48 were noted for comparability purposes in Table 10.11

No significant correlations were found between the total number of negative life events experienced in any of the four developmental periods and symptoms of psychopathology in late-life amongst EO participants. A moderately large, positive correlation was found between the total quantity of negative life events in childhood and trait anxiety in late-life amongst LO participants. A moderate, positive correlation was also found between the total number of negative life events experienced in adulthood and anxiety sensitivity in late-life. No correlations were found between the total number of life events experienced in either late adulthood or in the year prior to the interview and symptoms of psychopathology in late-life for the LO group.

Table 10.11

Relationship between the Total Quantity of Negative Life Events per Developmental Period (quantity score) and Symptoms of Psychopathology in Participants with EO GAD (N = 21)

Developmental Period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Childhood (0 – 15)	-.199	-.154	.029	.037	-.269
Adulthood (16 – 49)	-.331^	-.044	.000	.235	-.029
Late adulthood (50 to past year)	-.322^	-.022	.133	.130	-.270
Year prior to interview	-.159	-.007	.090	.317	-.088

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; ^ Correlation considered significant with a sample size of N = 48

Table 10.12

Relationship between the Total Quantity of Negative Life Events per Developmental Period (quantity score) and Symptoms of Psychopathology in Participants with LO GAD (N = 48)

Developmental Period	Measures of psychopathology				
	GDS	GAI	PSWQ	STAI-T	ASI
Childhood (0 – 15)	.122	.152	.142	.423**	.282
Adulthood (16 – 49)	.222	.066	.050	.254	.294*
Late adulthood (50 to past year)	.218	-.002	-.116	.208	.217
Year prior to interview	.172	.066	-.059	.122	.140

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

10.7. Examination of Exploratory Research Question 5: The Mean Number of Specific Negative Life Events Experienced per Developmental Period and throughout Life by Older Adults with EO and LO GAD

Descriptive statistics for the mean number of specific life events experienced in each of the four developmental periods and across the lifespan for EO and LO participants are presented in Table 10.13. Comparison of means using independent-samples t-tests were performed to examine differences between EO and LO participants in the mean number of specific events experienced in each developmental period and throughout life. On average, participants were not found to differ with regard to the number of events involving the death of significant others across the lifespan. Analyses revealed no significant difference between onset groups in mean number of events involving the death of significant others across the lifespan or within any of the four developmental periods. Onset groups were also found to be similar with regard to the mean number of events involving significant illness of self and others, negative socio-economic circumstances, sexual abuse, physical abuse, and CDW events experienced in each of the respective developmental periods and across the lifespan.

EO participants were found to have experienced a significantly greater number of events involving emotional abuse and neglect in childhood than LO participants at the .05 level. Groups did not differ with regard to the mean number of events involving emotional abuse in adulthood, late adulthood, in the year prior to interview, or across the lifespan. On average, EO participants reported significantly more events involving relational stress in adulthood than LO participants at the .05 level. Regarding experiences involving problem behaviour of significant others, those with EO GAD reported a significantly greater number of events in adulthood at the .01 level, in the year prior to interview at the .05 level, equal variances not assumed, and throughout life at the .01 level than LO participants. Onset groups were similar with regards to the number of events involving problem behaviours of significant others experienced in childhood.

Table 10.13

Mean Number of Specific Life Events Experienced per Developmental Period and Across the Lifespan for EO and LO Participants (N = 69)

	Early Onset (N = 21)		*Late Onset (N = 48)*		*Significance test*
Life event cluster	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Death of significant others	2.95	1.53	3.42	1.76	$1.05_{[67]}$
Childhood	0.24	0.54	0.31	0.72	$0.42_{[67]}$
Adulthood	1.48	1.12	1.42	1.15	$0.20_{[67]}$
Late adulthood	1.05	1.07	1.44	0.99	$1.47_{[67]}$
Year prior to interview	0.19	0.40	0.25	0.53	$0.46_{[67]}$
Significant illness – Self	2.57	1.89	2.08	1.67	$1.07_{[67]}$
Childhood	0.29	0.46	0.15	0.36	$1.23_{[30.85]}$†
Adulthood	0.81	0.81	0.60	0.68	$1.09_{[67]}$
Late adulthood	1.00	0.84	0.77	0.78	$1.10_{[67]}$
Year prior to interview	0.48	0.75	0.56	0.71	$0.46_{[67]}$
Significant illness – Others	6.57	3.25	6.25	4.74	$0.28_{[67]}$
Childhood	1.00	0.71	0.65	0.76	$1.82_{[67]}$
Adulthood	2.05	1.32	1.96	1.38	$0.24_{[67]}$
Late adulthood	2.00	1.18	2.00	1.56	$0.00_{[67]}$
Year prior to interview	1.52	1.12	1.65	3.37	$0.16_{[67]}$
Socio-economic circumstances	1.81	1.99	1.82	1.92	$0.21_{[67]}$
Childhood	0.38	0.50	0.38	0.49	$0.05_{[67]}$
Adulthood	0.90	0.83	0.88	0.96	$0.12_{[67]}$
Late adulthood	0.38	0.80	0.42	0.74	$0.18_{[67]}$
Year prior to interview	0.14	0.36	0.25	0.60	$0.76_{[67]}$
Sexual abuse	0.29	0.96	0.21	0.92	$0.32_{[67]}$
Childhood	0.14	0.65	0.08	0.45	$0.46_{[67]}$
Adulthood	0.14	0.48	0.08	0.45	$0.49_{[67]}$
Late adulthood	0.00	0.0	0.02	0.14	$0.66_{[67]}$
Year prior to interview	0.00	0.0	0.02	0.14	$0.66_{[67]}$

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

† Equality of variances not assumed (Levene's test significant)

Table 10.13- continued

Mean Number of Specific Life Events Experienced per Developmental Period and Across the Lifespan for EO and LO Participants (N = 69)

	Early Onset (N = 21)		*Late Onset (N = 48)*		*Significance test*
Life event cluster	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Physical abuse	1.10	1.30	0.81	1.07	$0.95_{[67]}$
Childhood	0.57	0.60	0.50	0.58	$0.46_{[67]}$
Adulthood	0.43	0.60	0.31	0.55	$0.78_{[67]}$
Late adulthood	0.05	0.22	0.00	0.00	$1.00_{[20]}$†
Year prior to interview	0.05	0.22	0.00	0.00	$1.00_{[20]}$†
Emotional abuse	3.71	3.32	2.50	2.50	$1.50_{[30.37]}$†
Childhood	1.48	1.12	0.88	0.91	$2.34_{[67]}$*
Adulthood	1.38	1.43	0.79	0.87	$1.75_{[26.76]}$†
Late adulthood	0.43	0.68	0.42	0.68	$0.07_{[67]}$
Year prior to interview	0.24	0.44	0.17	0.38	$0.69_{[67]}$
Crime/disaster/war events	1.29	2.45	1.75	2.24	$0.77_{[67]}$
Childhood	0.52	2.18	0.60	1.77	$0.16_{[67]}$
Adulthood	0.48	0.75	0.88	1.63	$1.07_{[67]}$
Late adulthood	0.29	0.46	0.25	0.44	$0.31_{[67]}$
Year prior to interview	0.00	0.00	0.02	0.14	$0.66_{[67]}$
Negative relationships with others	8.11	3.51	7.04	4.46	$0.97_{[67]}$
Childhood	1.29	0.90	1.19	1.10	$0.36_{[67]}$
Adulthood	4.01	1.73	2.94	1.99	$2.14_{[67]}$*
Late adulthood	1.90	1.09	2.00	1.85	$0.27_{[60.83]}$†
Year prior to interview	0.90	0.94	0.92	1.01	$0.05_{[67]}$
Problem behaviours of significant others	4.05	2.40	2.32	2.20	$2.93_{[67]}$**
Childhood	0.38	0.5	0.31	0.51	$0.51_{[67]}$
Adulthood	1.81	1.33	0.98	1.12	$2.66_{[67]}$ **
Late adulthood	1.10	0.89	0.77	0.86	$1.43_{[67]}$
Year prior to interview	0.76	0.89	0.25	0.53	$2.46_{[26.33]}$*†

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

† Equality of variances not assumed (Levene's test significant)

10.8. Examination of Exploratory Research Question 6:
The Mean Number of Total Life Events Experienced per Developmental Period and throughout Life

Descriptive statistics for the mean number of total life events experienced in each of the four developmental periods and throughout life for EO and LO participants are presented in Table 10.14. Overall, the two groups appeared similar with respect to the total number of negative life events experienced in each developmental period and throughout life. Independent-samples t-tests were performed to compare early-and late-onset groups on mean number of life events experienced in each developmental period and throughout life. No difference was found between groups in mean number of life events experienced in childhood. On average, the EO group experienced a greater number of negative life events during adulthood than those in the LO group, which was significant at the .05 level. Onset groups did not differ in mean number of negative life events experienced in late adulthood, nor were they found to differ in the mean number of negative life events experienced in the year prior to the interview. On average, participants in the EO group were found to experience a greater number of negative life events throughout life than those in the LO group, however this difference was non-significant.

Table 10.14

Mean number of Total Life Events Experienced per Developmental Period and throughout Life for EO and LO Participants (N = 69)

	Early Onset (N = 21)		*Late Onset (N = 48)*		*Significance test*
Developmental period	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Childhood	6.29	5.53	5.04	3.38	$1.15_{[67]}$
Adulthood	13.49	5.80	10.84	4.17	$2.14_{[67]}$*
Late adulthood	8.19	2.66	8.08	4.04	$0.11_{[67]}$
Year prior to interview	4.29	2.85	4.08	4.03	$0.21_{[67]}$
Lifespan – total events	32.44	13.32	28.30	11.09	$1.34_{[67]}$

*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$

10.9 Discussion

Chapter Ten sought to explore the relationship between negative life events and late-life psychopathology amongst older adults with early-and late- onset GAD by investigating research questions 4 and 5. Research question 4 addressed the question of whether older adults with early- and late-onset GAD differ in the frequency and severity of stressful life events preceding the onset of psychopathology, and was interested in examining the hypothesis that environmental precipitants play a more important role in LO GAD than in EO GAD. The hypotheses that onset groups would differ with regard to the frequency and severity health-related events preceding the onset of both present and past episodes of clinically significant anxiety and/or mental illness were partially supported by the present data.

Hypothesis 10a and 10b were not supported by the current data, which revealed that EO and LO groups of older adults did not differ with respect to the frequency or severity of health-related events preceding the onset of the presenting episode of GAD. This finding is in line with those of Le Roux et al. (2005), who found no support for the hypothesis that older adults with LO of GAD symptoms were more likely to have experienced negative life events such as widowhood or poor health than those with EO of anxiety. Le Roux et al. (2005), however, noted that the measures used to assess negative life events in their study (i.e. current marital status, total number of medical conditions and MMSE) were fairly insensitive and that they did not collect data on other negative life events associated with aging. It is possible that the similarity in ages of EO and LO participants at onset of the presenting disorder (58.5 vs. 59.6 years) may account for the findings of no difference in the frequency and severity of negative health-related events as at that age, both groups of participants would have experienced similar changes and/or losses in their health or the health of significant others.

There was some evidence to support hypotheses 10c and 10d. Specifically, investigation of the frequency of stressful life events experienced prior to first onset of an anxiety disorder of any kind (GAD) confirmed a higher prevalence of both health-related events and negative financial circumstances to precede the onset of psychopathology in the LO group

(hypothesis 10c). Furthermore, the current findings revealed significant relationships between the first onset of GAD amongst LO participants and the severity of health-related events, events involving negative financial circumstances, and events involving changes in education and/or occupation (hypothesis 10d). These findings are in line with the model put forth by Boyd et al. (2001) proposing that LO of psychopathology is associated with the experience of more environmental/life stressors preceding episode onset.

It is not surprising that the LO group was found to report a greater frequency of health related changes prior to first lifetime onset of a GAD (hypothesis 10c), considering the significant difference in mean age at onset between LO and EO participants at this time (52.9 vs., 15.0 years). Given that a number of health-related problems commonly begin in middle- to late-adulthood (for example, cholesterol, high blood pressure, type II diabetes and problems with arthritis), and that these conditions are likely to be ongoing rather than to remit, the occurrence of these losses and/or changes in health may therefore be a precipitating or contributing factor to the development of LO anxiety. The present data, which are in support of hypothesis 10c and 10d, are also consistent with previous findings of Raj et al. (1993), who found older adults with LO PD to cite medical events as well as financial and interpersonal problems as stressors occurring prior to episode onset. Although the current sample predominantly had a principal diagnosis of GAD, LO participants were similarly found to report changes and/or difficulty with health and financial circumstances as stressors preceding first onset of a DSM-IV anxiety disorder at significantly higher rates than EO participants.

Partial support for the current findings related to hypotheses 10c and 10d can also be seen in those of De Beurs et al. (2000). In their study investigating factors effecting destabilisation to, and chronicity of anxiety in a two-wave longitudinal design, De Beurs and colleagues identified the deterioration of health and functioning as one of two types of stressors that had occurred between assessments that was associated with an increase in anxiety symptoms. These findings were replicated by De Beurs et al. (2001) in a further investigation in which major illness of a family member was found to be predictive of becoming anxious in late-life. While these latter investigations by De Beurs et al. (2000, 2001) were not onset specific, they examined older adults without psychopathology who

then went on to develop psychopathology later in life, as is seen in those older adults in the present study with LO GAD. Further, although causality cannot be established for the present data, the findings of De Beurs et al. (2001) support the current findings and indicate that negative events involving health and finances may be more likely to contribute to the onset of a DSM-IV disorder in people having their first onset at 34 years of age or later.

The hypothesis that LO participants would report a greater number of stressful events preceding the onset of both the presenting episode of GAD and first episode of GAD (10e) was not supported by the current findings, in line with previous research (Sheikh, et al., 2004). It is worth mentioning that there was a trend towards a greater mean number of negative life events preceding first onset of GAD amongst LO participants, raising the possibility that this finding may be significant with a greater sample size. Further research with a greater sample size is required to investigate this hypothesis before any concrete claims can be made about this relationship.

Research question 5 (RQ5) aimed to investigate the relationship between the experience of negative life events across the lifespan and symptoms of psychopathology in late-life amongst older adults with early- and late-onset GAD. Due to a lack of previous research regarding this relationship, six exploratory research questions (1 - 6) were put forward to examine this broader research question in further detail. In light of the absence of previous investigations with which to directly compare the current findings, where relevant, the current findings are discussed with reference to previous findings of Kraaij & De Wilde (2001), who investigated the relationship between negative life events and depression in a sample of older adults not distinguished by age of onset.

The current investigation explored the prevalence of negative life events experienced by early-and late-onset participants in specific developmental periods and throughout life (Exploratory research question 1). This exploratory analysis revealed that all older adults in the current sample reported at least one negative event during their life. For both EO and LO groups, these events predominantly concerned the death of significant others, severe illness of themselves and others, emotional abuse and neglect, relational stress, and problem behaviours of significant others.

The aim of exploratory research question 2 was to understand the relationship between the experience of specific negative life events during each developmental period and symptoms of anxiety, worry and depression in later life amongst older adults with EO and LO GAD. A number of negative events experienced in childhood and late adulthood were found to be significantly associated with symptoms of psychopathology in late life amongst EO participants, whilst significant associations between negative life events and symptoms of psychopathology were found across all four developmental periods for the LO group. Findings for the EO group were unusual in that significant relationships were predominantly negative, indicating that the experience of one or more negative life event was related to low scores on self-report measures of anxiety, worry and depression. On the other hand, significant relationships between the experience of negative life events per developmental period and self-reported symptoms of psychopathology in later life by those with LO GAD were all positive, indicating that the experience of one or more negative life events was associated with high scores on self-report measures of psychopathology.

Catastrophic events experienced in early childhood and extreme experiences during WWII have previously been found to be related to depression in late life (Beekman, et al., 1995). In contrast to these findings, the present data revealed a strong and significant negative relationship between CDW events in childhood and symptoms of worry and trait anxiety in older adults with EO GAD. These findings indicate that the experience of one or more of these events in childhood amongst the present sample of older adults with EO GAD is not associated with worry or the tendency to be anxious in later life.

Negative life events involving the severe illness of a significant other in late adulthood was significantly associated with low scores on measures of depression and anxiety sensitivity in late life amongst older adults with EO GAD. These findings suggest that experiences of severe illness involving significant others in late-adulthood may not be considered to be as negative or as stressful as other events in this stage of life that may be more personally relevant for those with EO of GAD.

In contrast to findings for childhood, the experience of CDW events in late adulthood amongst EO participants was significantly associated with symptoms of trait anxiety. A significant relationship was also found between the experience of negative socio-economic circumstances in late adulthood and symptoms of trait-anxiety in the EO group. These findings highlight the negative impact of trauma experiences and difficult financial circumstances on psychological well-being in late-life, which may be maintaining factors or triggers to new episodes of anxiety amongst older adults with EO GAD.

The current data revealed a significant relationship between events involving problem behaviours of significant others in childhood and high trait anxiety amongst those with LO GAD. In addition, sexual abuse in childhood was significantly associated with high scores on measures of trait anxiety and anxiety sensitivity in later life in the LO group. CDW events in adulthood were positively correlated with worry symptoms, whilst relational stress in adulthood was positively correlated with depressive symptoms in participants with LO GAD in late-life. Negative socio-economic circumstances in adulthood were significantly associated with both trait anxiety and anxiety sensitivity in late life amongst participants with LO GAD, as was the occurrence of sexual abuse in adulthood. Although there is no previous research with which to directly compare the current findings, the finding of a relationship between the occurrence of sexual abuse events and both the tendency to be anxious and to fear anxiety symptoms in late-life are in line with previous findings (Kraaij & de Wilde, 2001). In their study, Kraaij & De Wilde found the occurrence of sexual abuse events in adulthood and late adulthood to be significantly associated with depressive symptoms in a sample of older adults with late-life depression not distinguished by age of onset.

Severe personal illness and negative socio-economic circumstances in late adulthood were both significantly associated with symptoms of trait anxiety in participants with LO GAD. Severe personal illness in the twelve months prior to assessment was significantly associated with symptoms of anxiety, trait anxiety, anxiety sensitivity and depression, in the LO group. Negative socio-economic circumstances in the year prior to interview was significantly associated with depressive symptoms in late-life, whilst CDW events in the year prior to interview were associated with anxiety sensitivity in late-life. Finally, problem

behaviour of significant others in the year prior to interview was significantly associated with high scores on a measure of anxiety in late-life.

The current findings indicate that experiences of severe personal illness in later life have a significant impact on psychological wellbeing amongst older adults with LO GAD. Though not onset specific, these finding are consistent with previous findings of Kraaij & De Wilde (2001), who found the experience of severe personal illness in the twelve months prior to interview to be significantly associated with depressive symptoms in older persons. As with the current findings, this relationship was not found by Kraaij & De Wilde for either of the two earlier developmental periods. It is interesting to note that this relationship was not found for the EO group, and is keeping with the findings of research question 4 that negative health-related events are significantly more likely to precede the onset of LO GAD than EO GAD.

The finding that negative socio-economic circumstances was associated with high scores on one or more measure of psychopathology in late-life for LO participants in each of the three latter developmental periods also highlights the negative impact that such experiences have on the psychological well-being of older adults with LO GAD, and is also in line with findings of Research Question 4 discussed in this chapter. Overall the finding of significant relationships between severe personal illness, negative socio-economic circumstances, CDW events and problem of behaviour of significant others in the latter developmental periods, during which time the majority of LO participants had their first onset of GAD, and symptoms of psychopathology in late-life is in line with previous findings of Keller (2002) who found that the incidence of LO anxiety disorders was associated with more life stressors in the twelve months leading up to the onset of clinical anxiety. In addition, these findings support the model put forward by Boyd et al. (2000), proposing that LO anxiety is associated with greater levels of life than EO anxiety.

The aim of exploratory research question 3 was to explore the relationship between the total number of negative life events experienced throughout life and symptoms of psychopathology in later life for early-and-late onset groups. Investigation of this relationship revealed a significant association between the experience of negative socio-

economic circumstances throughout life and trait anxiety in late-life amongst EO participants. These findings indicate that financial circumstances throughout life may be a constant stressor and/or maintaining factor for anxiety amongst those with EO GAD. In contrast to findings for the EO group, severe personal illness, socio-economic circumstances, sexual abuse and relational stress experiences throughout life were all significantly correlated with high scores on one or more measure of psychopathology in late-life for the LO group. The current findings are in line with the diathesis-stress model put forward by Boyd et al. (2001; see Chapter Four) and adapted for the present study, according to which EO anxiety is associated with a greater cognitive or internal vulnerability to pathology and that fewer stressful and/or negative events are required to trigger the onset of psychopathology, whereas the experience and accumulation of stressful, negative events throughout life is associated with LO anxiety.

To investigate the accumulation of negative life events per developmental period, exploratory research question 4 examined the relationship between the total quantity of negative life events per developmental period and symptoms of psychopathology in late life for older adults with EO and LO GAD. No significant relationships were found between the total quantity of negative life events experienced per developmental period and symptoms of psychopathology amongst participants with EO GAD. On the other hand, for those with LO GAD, a significant relationship was found between the total quantity of events experienced in childhood and trait anxiety in late-life. A significant relationship was also found between the total number of events experienced in adulthood and anxiety sensitivity in late-life. The total quantity of events in late adulthood and the year prior to interview were not correlated with symptoms of psychopathology in late-life. These findings further lend support to the diathesis-stress model proposed and the theory that LO GAD, which is the first onset of GAD for the majority of LO participants, is associated with greater levels of life stress than for those with EO GAD.

The goal of exploratory research question 5 was to examine whether there were differences between onset groups in the mean number of specific negative life events experienced per developmental period and throughout life. EO participants were found to have experienced a significantly greater number of events involving emotional abuse in childhood, relational

stress in adulthood, and problem behaviours of others in adulthood, the year prior to interview and throughout life, than LO participants. These findings are in line with previous research by Hoehn-Saric et al. (1993), who found EO patients to have greater developmental difficulties and interpersonal adjustment than those with EO GAD in a sample of adult patients. Specifically, Hoehn-Saric and colleagues found those with EO GAD to score significantly higher than the LO group on individual items of the Childhood History Questionnaire (CHQ), including being "unpopular with peers," being "withdrawn" and a trend for "feeling left out". Although items on the Negative Events Questionnaire used in the current investigation are worded differently to those of the CHQ, the current finding of a greater number of events of 'emotional abuse' in childhood for the EO group at the .05 level, which included queries as to whether participants had been "teased, excluded or ignored by other children" in childhood is in line with the findings of Hoehn-Saric and colleagues. In addition, Hoehn-Saric et al. (1993) noted that high levels of distress during childhood including those caused by critical attitudes of parents towards their children have been associated with heightened anxiety. In the present study, criticism by others, including by parents and siblings was assessed as part of events described as 'emotional abuse', which was found to occur at a greater rate in the EO group in childhood, further lending support to the cognitive model proposing greater emotional vulnerability to psychopathology in those with EO anxiety, as outlined in Chapter Four.

In their investigation, Hoehn-Saric et al. (1993) further found the EO group to show significantly greater dysfunction or severity on the item "difficulties in marital or sexual relationships" as assessed by the Psychiatric History Rating Scale (PHRS), developed by the authors to obtain information about events in childhood, psychiatric history and marital adjustment problems. This is consistent with the current finding that the EO group reported a greater number of negative events involving relational stress in adulthood. These events included experiencing relationship problems with ones partner/s and having been divorced or separated. Hoehn-Saric and colleagues also found "a disturbed home environment in childhood" to distinguish onset groups, with the EO group being found to show greater dysfunction or severity on this variable. Although it is difficult to ascertain what 'disturbed home environment' entails, 'problem behaviours of others' in the current study, which involved events such as addictions, suicide and convictions of criminality in participants,

their parents, siblings, partner/s and children, may encompass events that would be considered as a "disturbed home environment." Interestingly, the current study revealed a difference between onset groups in the number of such events in adulthood at the .01 level and in the year prior to the interview at the .05 level, perhaps reflecting a problem in these areas in the partner/s of participants or with their children, rather than experiencing these events in their own childhood.

The aim of exploratory research question 6 was to examine whether there were differences between onset groups in the mean number of total life events experienced per developmental period and throughout life. The current data revealed a significant difference between onset groups in mean number of total life events experienced during adulthood, with EO participants experiencing a greater number of negative events in adulthood, on average, than those in the LO group at the .05 level. It is not surprising that EO participants experienced a greater number of negative events in adulthood, as this was the age range during which the majority of these participants had their first onset of a DSM-IV anxiety disorder (see Chapter Seven). This finding is also in line with the model put forward by Boyd et al. (2000) suggesting that the experience of stressful events early in life may not be more frequent or severe than those who go on to develop LO GAD, but in combination with a greater cognitive vulnerability to anxiety, contributes to the onset of anxiety amongst EO participants. Finally, onset groups were not found to differ in the mean number of total life events experienced in childhood, late-adulthood, the year prior to interview or throughout life.

10.10 Conclusions

In summary, the current findings indicate that LO GAD is distinguished from EO GAD by the frequency and severity of health-related events, the frequency and severity of events involving financial difficulty and the severity of events involving change in occupation and/or education as precipitating factors, with those in the LO group reporting greater frequency and severity for these events preceding first onset of GAD. These findings indicate that the role of precipitating events is significant for the LO group, and that environmental factors are perhaps less relevant in the development of EO GAD. These

findings are in line with the cognitive model put forward by Boyd and colleagues (2000), which is also considered relevant in accounting for and onset distinction in late-life anxiety.

Symptoms of trait anxiety in late-life amongst older adults with EO GAD in the present study were related to the experience of CDW events and negative socio-economic circumstances in late adulthood. Notably, the experience of negative socio-economic circumstances throughout life was associated with trait anxiety in the EO group, highlighting the negative impact of such experiences in this sub-group of anxious, older adults. Symptoms of psychopathology in older adults with LO of GAD in the current study were related to problem behaviours of significant others and sexual abuse in childhood; CDW events, relational stress, sexual abuse and negative socio-economic circumstances in adulthood; severe personal illness and negative socio-economic circumstances in both late adulthood and twelve months prior to interview; and CDW events and problem behaviours of significant others in the twelve months prior to interview. Regarding the accumulation of each life event cluster throughout life, severe personal illness, socio-economic circumstances, sexual abuse and relational stress experiences throughout life were all significantly correlated with high scores on one or more measure of psychopathology in late-life for the LO group. Furthermore, the accumulation of events in childhood and adulthood were associated with symptoms of trait anxiety and anxiety sensitivity in late-life amongst LO participants.

The findings for both EO and LO groups suggest that these negative events may have long-term consequences for the well-being of adults in later-life, in particular for those with LO of GAD. The current findings suggest that the incidence of LO GAD is associated with more life stressors in the lead up to the onset of clinical anxiety, in particular health related events; and that the experience and accumulation of stressful, negative events throughout life is associated with LO GAD, in line with the diathesis-stress model put forward by Boyd et al. (2000).

SECTION III:

AN INVESTIGATION OF THE IMPLICATIONS OF AN AGE OF ONSET DISTINCTION FOR THE TREATMENT OF LATE-LIFE GENERALISED ANXIETY DISORDER

CHAPTER ELEVEN

An Investigation of the Relationship between Age of Onset and the Treatment of Late- life GAD

11.1 Introduction

A significant amount of outcome data from case studies suggests that CBT is useful for the reduction of anxiety in older adults (Stanley & Beck, 2000). The potential efficacy of a wide range of approaches including exposure and response prevention, relaxation training, and cognitive therapy (CT) in both individuals and group formats has been reported for older adults with GAD (Barrowclough et al., 2001; Gorenstein et al., 2005; King & Barrowclough, 1991; Mohlman et al., 2003; Stanley, Beck, & Glassco, 1996; Stanley, Beck, et al., 2003; Wetherell, Gatz, & Craske, 2003). At present, however, relatively little is known about the implications of an onset distinction for the treatment of late-life GAD. Gaining an understanding of potential treatment implications is increasingly important, so that those older adults diagnosed with GAD can receive the best possible psychosocial care.

To this end, the current chapter sets out to summarise and review the exiting empirical literature relating to treatment implications of an onset distinction for late-life psychopathology. Although treatment implications of an onset distinction for late-life GAD have not previously been empirically examined, there is considerable empirical evidence relating to the implications for late-life depressive disorders. As previously mentioned, since anxiety and depression are closely related disorders (Barlow, 1988; Mineka, et al., 1998), particularly in late-life (Beekman, et al., 2000; de Beurs, et al., 2001; Flint, 1997), this literature will be considered in the current section of this chapter. In light of evidence of a bimodal distribution in age at onset of GAD, both in the literature (Beck, et al., 1996; Chou, 2009; Le Roux, et al., 2005) and as established in Section One of this thesis, the theoretical literature suggesting an age of onset difference in response to CBT for late-life GAD is then presented. Finally, the current chapter examines and presents the findings of a study investigating treatment outcomes for a sample of older adults with early-and late-onset GAD.

11.1.1 Implications of an onset distinction for the treatment of late-life depression

The implications of age at onset of illness for treatment response are not well understood. Some studies have suggested that EO of late-life depression is more difficult to treat (Brodaty, et al., 1991; Dew et al., 1997; Reynolds, et al., 1998), others have suggested LO late-life depression to be more difficult, (Alexopoulos et al., 1996), whilst other studies suggest neither one type to be more difficult than the other (Baldwin, Benbow, Marriott, & Tomenson, 1993; Barzega, et al., 2001; Flint & Rifat, 1997a, 1997b). In an early study of the prognosis of depression in older adults, Brodaty et al. (1993) found that older patients who experienced their first lifetime episode of major depression before age 60 were more likely to have a relapsing course. These findings led Brodaty and colleagues to conclude that "a history of recurrence and its corollary, early-onset depression, not surprisingly, predicted a poorer prognosis in the elderly" (p 594). Consistent with these findings, Dew et al. (1997) reported that patients who were older when they experienced their first episode of depression showed a more rapid, sustained response profile.

In another study into the effects of age at onset of first lifetime episode of major depression on treatment response, Reynolds et al. (1998) found that age at onset in older patients did not affect absolute rates of remission, relapse, recovery or recurrence during the first year of maintenance therapy. They did, however, find that time to remission was significantly longer in the EO group, suggesting that EO is associated with a slower or diminished rate of response to treatment. In their study patients with EO depression did not differ from those with LO in treatment intensity or focus, either pharmacological or psychotherapeutic, leading Reynolds and colleagues to conclude that the similarity of combined treatment received was the strongest determinant of similar outcomes found for both onset groups. In contrast to these findings, other studies have reported those with LO depression to have lower response rates to treatment and a greater tendency to relapse (Alexopoulos, et al., 1996; Kalayam & Alexopoulos, 1999). On the other hand, some researchers report findings of no difference with regard to treatment outcome. For example, Barzega et al. (2001) report that of the differences noted amongst those with EO and LO dysthymia, no significant difference has been found in the response to treatment.

In light of these previous findings Driscoll et al. (2005) investigated the relationship between age of onset and treatment response in a sample of older adults with single and recurrent depressive episodes and found that patients with LO recurrent depression took longer to respond to treatment than those with LO single episode depression (12 weeks vs. 8 weeks). Ultimately, the LO recurrent group was not found to differ from the other two groups in terms of categorical response, remission, or in relapse rates. In all, 70-80% of the study participants responded to treatment (with about half ultimately remitting) but differed in how long they took to respond. Patients with recurrent depression, regardless of age of onset, were more likely to require at least one augmenting agent to achieve stabilisation, thus accounting for the longer response time. The results suggest that both recurrent illness course and late age of onset may affect depressive episode characteristics and treatment response variability. Specifically, the findings of Driscoll et al. (2005) indicate that recurrent depression did not lead to worse outcome, but rather, slower response, in association with increased cognitive and functional impairment. In summary, despite taking longer to respond, patients with LO recurrent depression ultimately demonstrate similar response rates, particularly if augmentation pharmacotherapy strategies are employed. In another study, Gollan, Raffety, Gortner and Dobson (2005) found that patients with EO depression spent more time contending with elevated residual symptoms following recovery than adult-onset depressives, with EO depression continuing to exert negative effects in the form of residual depressive symptoms and shorter time-to-relapse despite successful response to CBT for depression.

The literature reviewed indicates that treatment implications for early-and late-onset depression may differ, however, the findings are mixed. Overall there is evidence to suggest that older adults with EO of depression are more likely to have a relapsing course of illness (Brodaty, et al., 1993; Gollan, et al., 2005) and to have a slower rate of response to treatment than those with LO depression (Reynolds, et al., 1998; Reynolds et al., 1996). There is some evidence to suggest that older adults with LO depression have a greater tendency to relapse (Alexopoulos, et al., 1996), whilst others report similar rates of response to treatment for both EO and LO depression (Barzega, et al., 2001; Driscoll, et al., 2005). Treatment implications of an onset distinction for late-life GAD are as yet unknown.

11.1.2 Implications of an onset distinction for the treatment of late-life GAD

Given that anxiety is very stable over time (Wetherell, et al., 2001), with at least half of older adults with GAD reporting an onset in childhood or adolescence (Beck, et al., 1996; Blazer, George, et al., 1991; Le Roux, et al., 2005) it would seem that for these individuals, longstanding and deeply held negative core beliefs about the self, others and the world may underlie their chronic anxiety. According to Wetherell et al. (2005), these core beliefs about the self need to be identified, understood, challenged and replaced with more adaptive schema in order for the individual to recover, suggesting an important role for cognitive techniques in the treatment of anxiety in older adults with EO of symptoms. In line with this, in a review paper of anxiety disorders in older adults and the role of behaviour therapy, Beck and Stanley (1997) note that "in considering the available prevalence data, age of symptom onset appears relevant, particularly as this may impact the effectiveness of cognitive behavioural treatments with older adults. Specifically, if the majority of older adults with anxiety disorders have experienced anxiety problems since early or middle adulthood, the chronicity of these conditions could diminish the effectiveness of behavioural treatment".(p 87). This suggests that behavioural treatments such as exposure therapy may be less efficacious for older adults with EO anxiety.

In light of these suggestions it appears that whilst CBT has been demonstrated to be efficacious in the treatment of anxiety in older adults (Stanley & Beck, 2000; Stanley & Novy, 2000), specific components of CBT may vary in the degree to which they bring about therapeutic change for those with early- versus late- age of onset. According to the cognitive model of EO and LO depression put forward by Boyd et al. (2000; See Chapter Four, Section One) and adapted to account for an age of onset distinction in anxiety, individuals with EO of GAD are thought to have a higher cognitive vulnerability to GAD than those with LO GAD. As such, those with EO GAD are more likely to have firmly entrenched, negative cognitive beliefs underlying their anxiety. On the other hand, those with LO GAD are thought to be more cognitively robust and to have a lower cognitive vulnerability to anxiety, with anxiety onset being a result of the accumulation of highly stressful events. As the aim of psychotherapy is to try and ameliorate these diatheses (vulnerabilities), individuals with EO GAD might therefore be expected to respond to CT techniques better than to BT techniques. Conversely, those with LO GAD might be

expected to respond to BT techniques such as problem solving to manage these late-life stressors, better than those with EO GAD, as previously suggested (Beck & Stanley, 1997; Wetherell, Hopko, et al., 2005).

The issue of whether certain elements of the cognitive- behavioural package are necessary for efficacious treatment of late-life GAD, or for example, whether behaviour therapy is less effective in treating those with EO versus LO GAD as suggested, is important considering that behaviour therapy (BT) is considered a simpler and more economical treatment than CT (Butler, Fennell, Robson, & Gelder, 1991). Unlike behavioural therapy however, CT might have the flexibility and range of applications to help patients deal better with the more common consequences of GAD such as demoralisation, loss of confidence, social anxiety and depression. Elucidating the mechanism of action of CBT and whether this varies according to age at onset could therefore lead to the development of more effective treatments for anxiety in older adults.

11.2 Conclusions

Current research has effectively delineated the many implications of an age of onset distinction for the treatment of late-life depression; however, treatment implications for an onset distinction in late-life GAD are as yet unknown. It is also necessary to clarify the theorised relationship between the differential efficacy of specific treatment components of CBT and age of onset. Despite reference to such a relationship (Beck & Stanley, 1997; Le Roux, et al., 2005), no empirical investigations of this relationship have been conducted to date. As such, it remains unclear as to how much each component contributes to treatment outcome and whether certain elements of the cognitive behavioural package are necessary for efficacious treatment of both early- and late- onset GAD. These issues highlight the need for further investigation regarding the relationship between age of onset and the treatment of GAD in older adults. As previously outlined, a better understanding of this relationship will assist in improving the psychosocial care that is provided to older adults with late-life GAD. Consequently, further research examining the mechanisms underlying successful psychotherapeutic treatment of early- and late- onset GAD is warranted.

11.3 Aims

The research presented in this chapter aimed to explore and acquire an understanding of factors specific to CBT associated with a positive treatment response amongst older adults with early- and late-onset GAD. The purpose of this study was to investigate differences between onset groups in patterns of responding to components of treatment, with a view to better understanding the treatment implications of an age at onset distinction in late-life GAD.

11.3.1 Research questions

The primary aim of study two was to examine the research question: What are the implications of an age of onset distinction for the treatment of late-life GAD? Drawing on previous literature summarised earlier in this chapter, the intensive nature of the present study allowed for the exploration of a number of specific relationships stemming from this broader research question. The following relationships are specifically addressed in this chapter:

1. The relationship between treatment components/time and levels of the dependent variables for the sample as a whole (EO and LO participants). It was predicted that there would be a significant improvement in levels of psychopathology from pre- to post-treatment for older adults with GAD.

2. The relationship between age of onset and levels of the dependent variables. In light of mixed findings in the depression literature regarding differences in treatment outcome for those with EO and LO depression (Section 11.1.1) the current study explored whether early-and late-onset participants differed in response to treatment, including the maintenance of treatment gains at six-month follow-up.

3. The interaction between age of onset and treatment components of CBT/time on levels of the dependent variables. Whilst this relationship has not been empirically examined before, a goal of this investigation was to clarify whether the efficacy of specific CBT components varies according to age at onset. Drawing on the cognitive model of early-

and late-onset anxiety proposed in Chapter Four, and literature suggesting the differential efficacy of specific CBT components for the treatment of EO and LO GAD (Beck & Stanley, 1997; Wetherell, Hopko, et al., 2005), it was predicted that onset groups would differ in response to specific treatment techniques. Specifically, it was predicted that:

a. Cognitive therapy techniques would be more efficacious in the treatment of EO GAD and be associated with a greater change on outcome measures at completion of the cognitive skills module for those with EO GAD than for those in the LO group, and;
b. Participants with LO GAD would have a better response to behavioural techniques than those with EO GAD, as reflected in significantly greater improvements on outcome measures at completion of the behavioural skills module for those with LO GAD than for those with EO of GAD.

11.3.2 Clinical implications

In terms of clinical implications, this study will delineate some of the factors that influence treatment outcomes for older adults with early- and late-onset GAD, the consequences of which are superior psychosocial care. Psychologists will be able to develop or tailor psychosocial interventions aimed at enhancing treatment response, therefore improving the psychological wellbeing of older adults with either a longstanding history or more recent onset of GAD. The interventions may aim to either reduce the use of treatment components or modules implicated in poorer outcomes, or enhance those implicated in superior outcomes. Examining the way in which older adults distinguished by age of onset respond to specific treatment modules of CBT will constitute a major advance in our understanding of the treatment of late-life GAD and lead to an improvement of psychosocial services for older adults.

11.4 Method

11.4.1 Participants

Of the 76 treatment-seeking older adults who were included in investigations of aetiology, phenomenology and life events, presented in Section Two, 75 were eligible and invited to take part in the present investigation, with one participant being referred on for further assessment of potential cognitive decline. Full details as to the recruitment process, inclusion and exclusion criteria are described in Chapter Six, section 6.1. Classification of these participants into early-and late-onset subgroups is outlined in section 7.3. Of these 75 participants, 43 elected to take part in the treatment study. Forty-one of these individuals completed all twelve sessions of cognitive behavioural therapy (CBT), whilst two dropped out in the early stages of the study. Both of these participants elected to drop out after four sessions, one due to ill health of their partner, and the other due to work commitments. Of the 32 participants who were eligible but declined participation, eleven wished to participate but were unable to due to factors such as caring for a terminally ill partner, moving interstate, and overseas travel, and a further three individuals had commenced therapy with another provider between the time of assessment and the present study. Five participants declined to take part as they felt it would be too confronting to bring up past experiences. The remaining thirteen who declined did not provide a reason. Of the 41 older adults who took part in this study, eighteen belonged to the EO group (43.9%) and twenty-three (56.1%) to the LO group. The EO sample included six males (33.3%) and twelve females (66.6%), with a mean age of 63.0 for males (SD = 3.90) and 60.50 for females (SD = 6.16). The LO sample included seven males (30.4%) and sixteen females (69.6%), with a mean age of 65.0 for males (SD = 8.94) and 62.31 for females (SD = 5.13). A flowchart depicting participant inclusion in the current investigation is presented in Figure 11.1

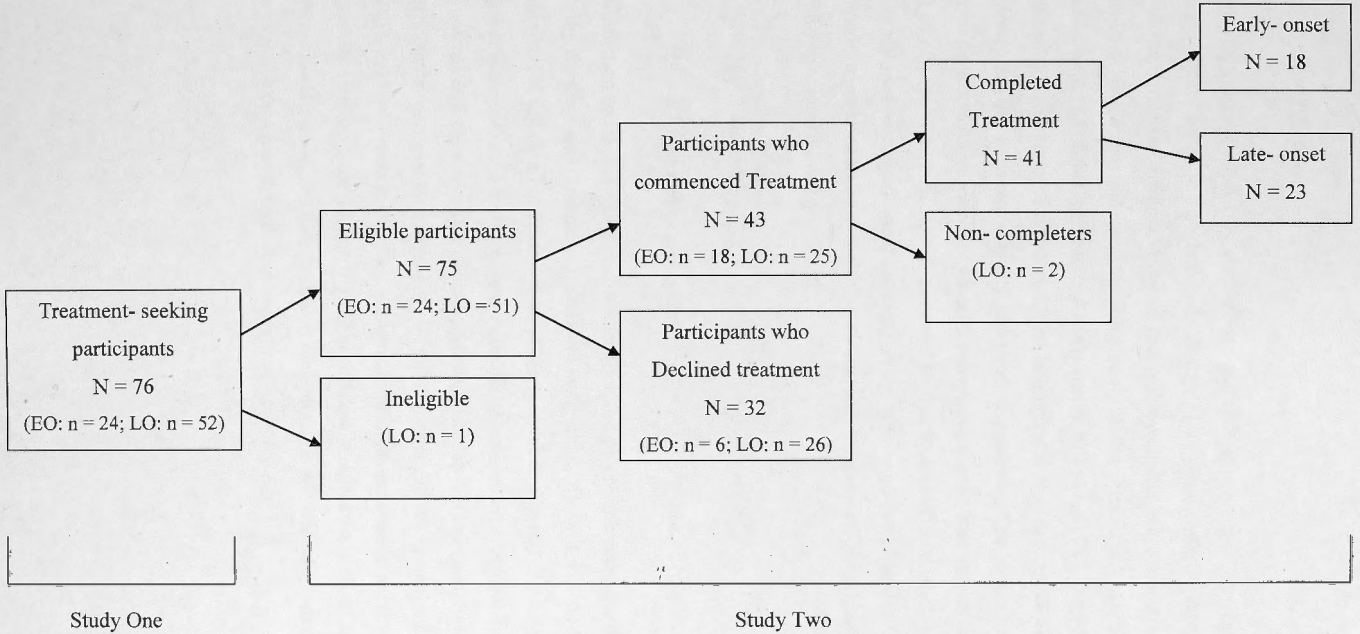


Figure 11.1 Flowchart of participants included in Study Two

11.4.2 Design

The study presented in this chapter was a quasi- experimental, prospective design. The study used a 5 x 2 factorial design (two-way mixed ANOVA). Time of assessment/measurement represented the within-subjects independent variable, with five levels; at initial assessment (T0), completion of the relaxation (T1), cognitive (T2) and behavioural (T3) skills module, and at six-month follow-up (T4). Age at onset of anxiety defined the groups to be compared, thus belonging to the early onset vs. late onset group represented the between subjects independent variable. The dependent variables were outcome scores on measures of anxiety, worry, depression, trait anxiety, anxiety sensitivity, locus of control beliefs, self-efficacy and an index of GAD severity. Dependent variables also included participant-rated level of anxiety, perceived usefulness of CBT strategies (i.e. somatic control exercises, cognitive skills, and behavioural skills) and participant-rated ability to cope with worry.

11.4.3 Materials

11.4.3.1 Descriptive characteristics

Information on the age of onset characteristics and psychiatric comorbidity were collected during the diagnostic assessment interview using the ADIS-IV-L (DiNardo, et al., 1994), described in full detail in Section 6.3.2. Demographic and health characteristics of the sample were collected during participants' initial assessment interview using a semi-structured interview schedule constructed to obtain detailed information about the participants' personal history (see Appendix D for the full assessment schedule). For full details as to information collected on demographic characteristics and the categories these variables consist of see Section 6.3.4. For full details regarding medical conditions assessed, description and categorization of medication use and information collected in participants psychiatric treatment history see Section 6.3.5

11.4.3.2 Primary outcome measures

Anxiety

The Geriatric Anxiety Inventory (GAI; Pachana et al., 2007) was used to measure the clinical symptoms of anxiety disorders (Appendix E). Participants completed the GAI as part of a series of questionnaires provided before, during, and six-months following cognitive-behavioural therapy (CBT) treatment. For a full description of the GAI, its scoring and its norms, see Section 6.3.8.

Worry

The Penn State Worry Questionnaire (PSWQ; Meyer, et al., 1990) was used to assess clinically significant pathological worry by measuring the tendency to engage in excessive worry, irrespective of the worry content, and associated ability to control worry (Appendix F). The PSWQ was completed as part of a series of questionnaires provided before, during, and six-months following completion of twelve sessions of CBT treatment. The PSWQ is described in full in Section 6.3.9.

Depression

The Geriatric Depression Scale (GDS-15; Sheikh & Yesavage, 1986a) was used to measure depressive symptoms in the current sample (Appendix G). The GDS-15 was completed as part of a battery of questionnaires completed before, during, and six-months post-completion of CBT treatment. For a full description of the GDS and its psychometric properties see Section 6.3.10

Participant-rated GAD symptom severity, experience of anxiety, coping with anxiety and usefulness of treatment components

For the purposes of the present study, a self-report treatment evaluation form was created to assess participant-rated severity of GAD symptoms and record participant evaluations regarding their experience of anxiety, the usefulness of treatment strategies learnt and ability to cope with anxiety following the completion of each treatment module (Appendix N). The severity of GAD symptoms was measured using DSM-IV criteria. The GAD section of the ADIS-IV-L (Di Nardo, et al., 1994), which asks questions about the severity of somatic GAD symptoms, was incorporated into the self-rated treatment sensitivity scale.

Using the same scale to elicit dimensional clinician ratings of the essential features of each disorder previously described in Section 6.3.7, participants were asked to rate the severity of symptoms on a scale of zero to eight where 0 = none, and 8 = very severe, which allows for judgment of the degree to which an individual experiences symptoms like restlessness or irritability.

In addition to symptom severity, participants were asked to use a rating scale of 0 to 8 to answer questions regarding the impact of learning and implementing each of the relaxation, cognitive and behavioural strategies on their experience/level of anxiety and how useful participants find these skills in managing their anxiety. Ability to cope with anxiety was rated on a five-point scale from one to five, where 1 = "poor" and 5 = "excellent" (See Appendix N). This measure was completed by participants following completion of each treatment module and at six-month follow-up.

11.4.3.3 Secondary outcome measures: Trait Anxiety, Anxiety Sensitivity, Self Efficacy and Perceptions of Anxiety Control

Trait anxiety

The Speilberger State-Trait Anxiety Inventory- Trait scale (STAI-T; Spielberger, et al., 1983) was used to assess participants' general tendency to be anxious. The STAI-T was completed prior to and six months following the CBT programme, respectively. Scale description, scoring and psychometric properties are outlined in Section 6.3.11.

Anxiety sensitivity

The Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1987) (ASI; Peterson & Reiss, 1987) was used to measure fear of anxiety symptoms. Participants completed the ASI as part of the first and final set of questionnaires provided, prior to and six months following completion of CBT treatment. Full details of this scale including scoring and scale norms can be found in Section 6.3.12.

Self Efficacy

The Self Efficacy Scale (SES; Sherer, et al., 1982) was used to assess general and social self-efficacy (Appendix H). The SES was completed as part of the first and final battery of questionnaires, completed prior to and six months following CBT treatment respectively. The Self Efficacy Scale is previously described in Chapter Six, Section 6.3.13.

Locus of control beliefs

The Anxiety Control Questionnaire (ACQ; Rapee, et al., 1996) was used to assess perceived control over anxiety-related events, including the extent to which a person believes they have control over a variety of potentially threatening internal events and situations, such as mental or physical reactions, disasters, and control over other people (Appendix I). The ACQ was completed as part of a series of questionnaires provided at initial assessment, prior to the CBT treatment programme, and again as part of the final battery of questionnaires completed six months following completion of CBT treatment. For full details of this scale and its psychometric properties see section 6.3.14

11.4.3.4 CBT Manual for Anxiety (GAD and Panic) in Later Life: 12- Session Modular Format

CBT was conducted according to a detailed manual designed specifically for the treatment of anxiety disorders in older adults, based on existing, empirically validated treatment protocols for anxiety (Craske, Barlow, & O'Leary, 1992; Gorenstein, Papp, Kleber, & Marc, 1999; Greenberger & Padesky, 1995; Stanley, Diefenbach, & Hopko, 2004). A summary of the treatment modules and outline of principles underlying the treatment contained in this manual can be found in Appendix O. Throughout treatment, participants were given handouts and homework sheets corresponding to each session. The handouts provided participants with a summary of the essential points covered during the session, as well as further reading and instruction on the participant's specific assignments for that week.

11.4.4 Procedure

Treatment seeking participants who took part in Study One (see Chapter Six for full details as to methodology for Study One) were contacted once the battery of questionnaires provided at initial interview (refer to section 6.4) had been completed and returned to the investigator to discuss eligibility and commencement of participation in the second phase of the study. Eligible participants meeting diagnostic criteria for GAD were invited to participate in a twelve-week CBT program for the treatment of GAD. Participants were offered treatment on an individual basis, according to a manualised protocol. Individual therapy sessions took place at the Australian National University (ANU) psychology Clinic. Sessions ran for 75 minutes on a weekly basis. The treatment program consisted of a (i) Psychoeducation and awareness module, (ii) relaxation skills module; (iii) cognitive skills module; and (iv) behavioural skills and skills application.

In the psychoeducation and awareness module, participants were given an overview of the treatment program and were provided with psychoeducation to convey the nature, processes and consequences of anxiety and worry, as well as to correct any misconceptions held by the client about anxiety. Participants were also presented with the tripartite model of anxiety, explaining the client's own presenting problems in terms of the physiological, cognitive, and behavioural facets of anxiety, to increase the participant's awareness of their own daily worries. The relaxation skills module consisted of somatic control exercises in the form of progressive muscle relaxation (PMR) training and included training in controlled, diaphragmatic breathing. Participants were also taught about relaxation by recall and cued relaxation. These methods focus on both physical and mental relaxation, and were included to directly target the physiological arousal and tension that are core components of anxiety, particularly GAD and panic disorders. Relaxation exercises were conducted in session, and participants were then given an audiotape with progressive muscle relaxation instructions and its variants read by their therapist to continue practice at home. The script for the taped exercise was provided to therapists in the treatment manual.

The cognitive skills module was designed to foster the recognition and replacement of anxious, negatively skewed styles of thought. This consisted of explaining the role of thinking and common logical errors in thinking, designed to impart on the client a sense that their way of thinking, and thus their experience of anxiety is modifiable. In these sessions participants were given instruction on self-monitoring of symptoms according to the cognitive-behavioural format, and taught to identify cognitive distortions such as overestimating and catastrophising. In addition, clients were taught about risk estimation, to look for evidence for and against their negative beliefs, and to apply alternative explanations. Participants were also provided with one session on sleep hygiene, between the cognitive and behavioural skills modules.

In the behavioural skills module, skills such as establishment of daily structure/activity scheduling and worry behaviour prevention were taught to participants in order to increase the client's activity, thus imparting a sense of control and mastery over ones activities and daily life. Problem solving was delivered to instil a sense of manageability in regards to problems that have arisen or may do so. Worry exposure for those with GAD was used to evoke the worries most salient to the individual. Repeated exposures and increasing control over the worry process focused on gradually replacing cognitive avoidance tendencies with acceptance and eventual habituation to certain emotional responses. In addition, exposure to avoided or anxiety-provoking situations and response prevention of safety behaviours was included.

The last session was devoted to relapse prevention. The latter half of the second last session was used to summarise all the interventions introduced to the clients during treatment. Participants were asked to identify worries that might still be excessive and/or vulnerable situations in which worries are likely or may be exacerbated in the future, and to generate a list of strategies or appropriate interventions to be applied in such instances. The distinction between a lapse and relapse was highlighted to participants, and they were further reminded that worrying is a normal phenomenon. Participants were also encouraged to read the handouts and readings given to them throughout treatment on a regular basis as a prevention technique, to refresh their understanding of anxiety and the strategies learnt to manage this.

Participants were asked to complete the GAI, PSWQ and GDS-15 (Appendices D through F) as well as treatment evaluation forms (Appendix N) as homework following the relaxation skills component of treatment (session four), and to return these to their clinician at the subsequent session. If questionnaires were not completed prior to the subsequent session, participants were asked to complete the questionnaires prior to the commencement of that session. This process was repeated following completion of the cognitive skills module (session eight). At completion of the behavioural skills components of treatment (session twelve), participants were provided with the questionnaires to be completed and a replied paid envelope in which to return completed measures. Participants were instructed to complete the questionnaires in the week following the last session (one week following the last session) before returning it to the investigator. When the questionnaires were not received within two weeks following the final treatment session, participants were given a phone call requesting them to complete the questionnaires as soon as possible, with questionnaires and a reply-paid envelope being resent if they had been misplaced or lost. At the completion of these twelve sessions, participants were invited to attend a booster session one month after completion of the program to follow-up on participants, to help with independent management of their anxiety, and to reinforce the use of techniques learnt in weekly sessions.

Six months following the completion of treatment, participants were sent the battery of self-report psychometric scales given to participants at the end of the initial interview, in addition to a follow-up questionnaire constructed by the investigator (Appendix N), with a reply paid envelope to complete and return to the investigator. Again, when the questionnaires were not received within two weeks following the final treatment session, a second set of questionnaires and a replied paid envelope were sent to participants with a letter reminding them to complete and return the questionnaire. A timeline of the assessment points and questionnaires completed at these times is illustrated in Figure 11.2.

Therapists in the study were nine Master's and doctoral students in clinical psychology who had specialised training in CBT, and the primary investigator, who also had specialised training in therapy with older adults. Three of the therapists were male and six were female. In addition to standard training received as part of the clinical program, which included

CBT, the principal investigator trained for the study by treating an older adult with GAD under the supervision of a senior psychologist, and another adult with panic disorder in late life under the supervision of an expert in therapy with older adults. Six of the other therapists worked under the supervision of the senior psychologist and clinic manager at the ANU psychology clinic, and two were supervised by a second senior clinician, also a registered clinical psychologist in the psychology department at the ANU. The other therapists were further trained by attending a workshop run by the primary investigator on working with older adults in a clinical setting, which included training on the treatment manual to be used by therapists, and briefing on the research protocol and appropriate procedures with reference to the research project. Therapists were supervised weekly on an individual basis by their primary supervisor, and in a group format with the primary investigator. Supervision sessions typically consisted of discussing sessions, problem-solving difficult issues, and preparing for the following week's sessions.

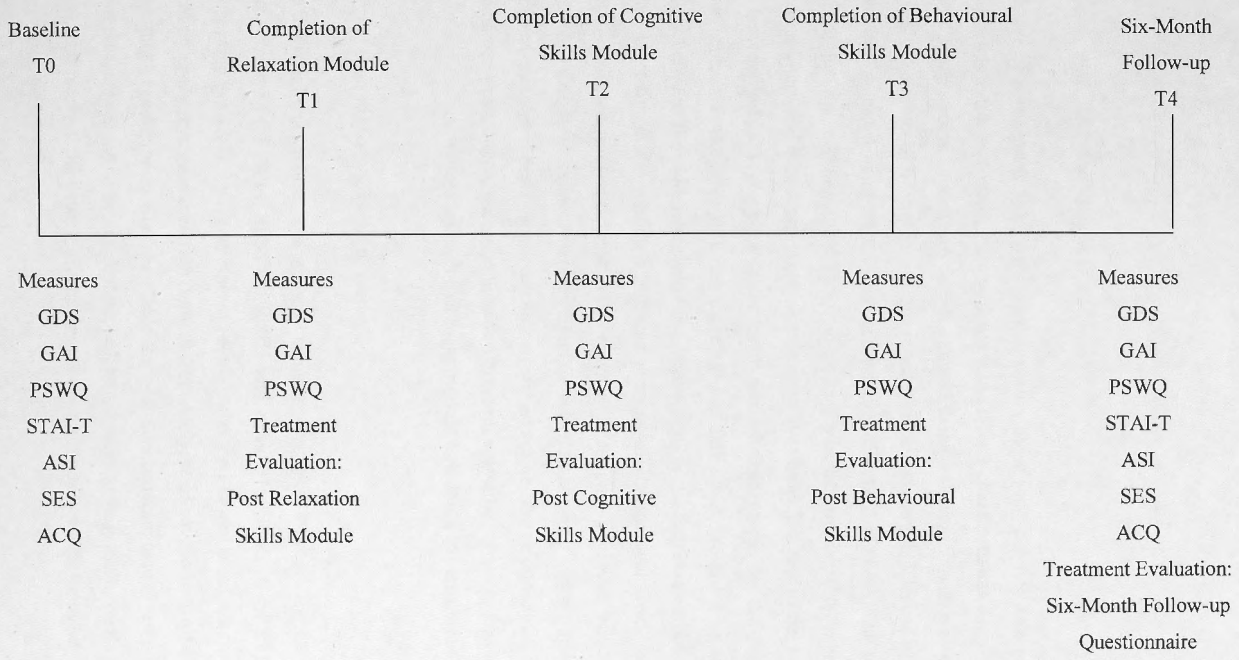


Figure 11.2 Time line of assessment points

11.5 Results

11.5.1 Data Analysis

11.5.1.1 Analysis plan

Comparison of participants who were treated versus those who did not take part in the treatment study on age at onset, demographic and clinical characteristics as measured by self-report psychometric inventories was conducted using independent-samples t-tests and χ^2 analyses. The effect of treatment and age at onset on the primary and secondary outcome measures was assessed using mixed between-within subjects ANOVAs. The test of the main effect for the within-subject factor examined whether participants exhibited any change on primary and secondary outcome measures over time. The test of the main effect for the between-subjects grouping factor examined whether scores on the primary and secondary outcome measures differed for early-and late-onset groups. The test of the interaction between the within-subjects and between-subjects factors examined whether scores for the two groups exhibited different patterns of change over time. In addition, Bonferrom-corrected post-hoc tests were conducted as part of these mixed-between subjects ANOVAs to examine where differences occurred between groups and/or across time. Paired-samples t-tests were performed to examine the significance of these. Independent-samples t-tests were conducted to determine whether onset groups differed in evaluations of the 'usefulness' of each treatment module in helping to manage their anxiety.

11.5.1.2 Data preparation and screening

All data collected were entered and analysed using the Statistical Package for the Social Sciences version 14 (SPSS 14: SPSS Inc, 2005), and version 16 (SPSS 16: SPSS Inc, 2008) when it became available. Two participants belonging to the LO group did not complete the treatment program, and were therefore omitted from analyses of psychometric data. All of the remaining 41 participants who completed the treatment program completed pre-treatment measures at initial assessment, as well as questionnaires given throughout treatment, and returned the battery of measures at six-month follow-up. Items on all measures returned were complete.

Scores on the relevant items of the Geriatric Depression Scale (GDS-15: Sheikh & Yesavage, 1986b), the Penn State Worry Questionnaire (PWSQ: Meyer, et al., 1990), the Spielberger State-Trait Anxiety Inventory- Trait scale (STAI-T: Spielberger, et al., 1983) and relevant subscale items of the Self Efficacy Scale (SES: Sherer, et al., 1982), and Anxiety Control Questionnaire (ACQ: Rapee, et al., 1996) were reversed. Item scores were summed to calculate the relevant overall and/or subscale scores on the Geriatric Anxiety Inventory (GAI: Pachana, et al., 2007), the PWSQ, the GDS-15, the STAI-T, the Anxiety Sensitivity Inventory (ASI: Peterson & Heilbronner, 1987; Peterson & Reiss, 1987), the SES, and the ACQ. Internal reliabilities were calculated for all of the scales at each time-point measured. Reliabilities are presented in Table 11.1 and range from good to excellent for each of the scales and subscales. Of concern are the lower reliabilities reported for the GDS-15 and the SSE subscale. The low reliabilities were reported at Time 3, following the behavioural component of CBT for the GDS-15 and at follow-up for SSE subscale. Item deletion did not improve the reliabilities of any of the subscales.

Table 11.1

Internal Reliabilities of Psychometric Scale Scores across T0 to T4

Scale	Cronbach's α
The Geriatric Anxiety Inventory (GAI)	.62 - .85
The Penn State Worry Questionnaire (PSWQ)	.82 - .87
The Geriatric Depression Scale -15 (GDS-15)	.55 - .81
The State-Trait Anxiety Inventory– Trait scale (STAI-T)	.89 - .90
The Anxiety Sensitivity Index (ASI)	.92
The Self Efficacy Scale (SES)	
General Self Efficacy (GSE)	.87 - .88
Social Self Efficacy (SSE)	.59 - .67
The Anxiety Control Questionnaire (ACQ)	.82 - .86

Prior to data analysis, data were screened for accuracy of data entry, missing values, univariate outliers, and fit between their distributions and the assumptions of analysis (normality, linearity, homoscedasity). With the exception of the GDS-15 (Sheikh & Yesavage, 1986b), inspection of the scale distributions revealed that all scales and subscales were normally distributed. The distribution for the GDS-15 illustrated a slight positive skew and kurtosis at all five assessment points, indicating that most participants reported lower levels of depression as measured by the GDS-15. This was significant at baseline and at six-month follow-up. This is not surprising given that the majority of participants had a principal or co-principal (i.e., most severe) diagnosis of GAD according to DSM-IV-TR criteria and reported symptoms of anxiety rather than depression to be their primary problem of concern. For this reason, a decision was made not to transform this variable.

The distributions for all remaining measures of psychopathology illustrated a slightly negative skew at baseline (T0) and were positively skewed at 6-month follow up (T4). This was as expected, with high scores on outcome measures at baseline being consistent with participants having a diagnosis of clinically significant GAD for which they were seeking treatment and low scores following treatment reflecting a positive response to treatment on outcome measures. Similarly, distributions for the SES and the ACQ, on which high scores reflect better locus of control and self efficacy, illustrated a slight negative skew at T0. A single case with a high z score on the GDS-15 and GAI ($z > 3.29$, $p < .001$, two-tailed test), and a high but non-significant z-scores using $p < .001$ criterion on the STAI-T and ASI at six-month follow-up was identified as a univariate outlier. Inspection of the individual z-scores revealed that this outlier was the same case on each of these variables and appears to be an individual who had a relapse in their psychiatric condition at follow-up, six months post-treatment. This outlier was included in the analyses as it was necessary to maintain the moderate size of the sample thus ensuring adequate power of analyses (Tabachnik & Fidell, 2001). In addition, given the clinical nature of the study and the fact that relapse and consequent extreme scores at follow-up is a plausible result, it was determined that this case was from the intended population.

11.5.2 Descriptive Analysis

11.5.2.1 Analysis of EO and LO participants

Participants taking part in the present investigation were a subsample of those participants included in previous empirical investigations set out in this thesis (see Methods section 11.4). Therefore, as with investigations for the overall sample (see Chapter Eight and Nine), the demographic, health, psychiatric comorbidity, genetic and psychological characteristics of the current sample were investigated to provide an overall description of the sample recruited. These analyses are presented and discussed in Appendix P. The significant differences found in the analyses presented in Appendix P are summarised as follows: (i) LO participants were significantly older at first onset of any DSM-IV disorder than EO participants; (ii) LO participants were significantly older at first onset of an anxiety disorder of any kind than EO participants; (iii) EO participants were found to have a higher mean number of episodes of psychiatric illness than LO participants; and (iv) EO participants were found to have a greater history of anxiety with respect to time since first onset of both a DSM-IV anxiety disorder and a DSM-IV disorder of any kind than LO participants.

11.5.2.2 Analysis of treated versus untreated participants

Analyses were conducted to determine whether there was a difference in age at onset, demographic, and clinical characteristics of those participants who took part in the treatment programme and those who were seeking treatment but declined to take part for various reasons. Treated and untreated participants were not further differentiated by onset group in analyses due to small sample sizes. Where significant differences were found between treated and untreated groups, groups were further differentiated by onset and analysed where cell size permitted, to investigate whether such differences varied by onset. The findings of these analyses are presented in Appendix Q. Significant differences that were found in the analyses presented in Appendix Q are summarised as follows: (i) There were significantly more single participants in the untreated group than expected and more married participants in the treated group. Of those, there were significantly more LO participants who were single and/or never married in the untreated group than expected;

and (ii) Participants taking part in the treatment study were found to have significantly higher scores on measures of anxiety and anxiety sensitivity than those who went untreated.

11.5.3 Primary Treatment Outcomes

Measures of anxiety (GAI: Pachana, et al., 2007), worry (PSWQ: Meyer et al., 1990) and depression (GDS-15: Sheikh & Yesavage, 1986) were completed by participants at each of the five assessment points (see Figure 11.1 in section 11.3.4) in order to investigate the impact of age at onset on participants' scores on these primary outcome measures from pre-treatment (T0) to six-months following completion of treatment (T4). Participant-rated severity of GAD symptoms, level of anxiety and ability to cope with anxiety were evaluated by participants at the conclusion of each treatment module and at six-month follow-up (T1 through to T4).

A series of mixed between-within subjects Analysis of Variance (ANOVA) were conducted to assess the impact of age at onset on levels of these primary outcome measures. The ANOVA test assumption of homogeneity of variance (sphericity) was not met for the main effect of time and interactions between time and onset. Accordingly, for outcome measures where $\varepsilon > .75$ (GAI, GDS, participant-rated GAD symptom severity, overall level of anxiety and coping), degrees of freedom were corrected using Huynh-Feldt estimates of sphericity. For outcome measures where $\varepsilon < .75$, (PSWQ), degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity. Where relevant, Bonferroni corrected post-hoc tests based on estimated marginal means were examined to identify where differences across time occurred. Paired-samples t-tests were performed to examine the significance of these differences. Descriptive data for primary outcome measures by group and the results of measures analysed using mixed between-within subjects ANOVAs are presented in Table 11.2

Table 11.2

Means (SD) for Primary Outcome Measures by Group at T0 and T4 and F-values as a Function of Time and Age of Onset

	Early-Onset (n = 18)	*Late-Onset (n = 23)*	*Time*		*Onset*		*Time x Onset*	
	M (SD)	*M (SD)*	$F_{[df]}$	η_p^2	$F_{[df]}$	η_p^2	$F_{[df]}$	η_p^2
GAI			$68.1_{[3.26, 127.15]}$***	.64	$.05_{[1,39]}$	.000	$.45_{[3.26, 127.15]}$	.01
T0	13.11 (4.13)	13.95 (5.08)						
T1	11.83 (4.55)	12.35 (4.20)						
T2	6.56 (3.33)	6.57(3.09)						
T3	5.61 (3.48)	4.91(3.06)						
T4	5.17 (3.01)	4.65 (4.43)						
PSWQ			$72.47_{[2.45, 95.41]}$***	.65	$1.93_{[1,39]}$	.05	$.30_{[2.45, 95.41]}$	.01
T0	64.00 (9.61)	60.52 (9.39)						
T1	60.56 (10.19)	57.39 (847)						
T2	50.00 (8.88)	46.74 (6.47)						
T3	45.44 (9.09)	44.61 (5.26)						
T4	44.94 (9.57)	41.70(8.29)						
GDS-15			$15.37_{[3.25,126.87]}$***	.28	$.12_{[1,39]}$	.003	$.50_{[3.25, 126.87]}$	.01
T0	5.17 (3.65)	4.74 (2.47)						
T1	5.11 (3.83)	5.83 (3.54)						
T2	3.11 (2.37)	3.52 (2.69)						
T3	2.22 (1.66)	2.74 (2.00)						
T4	3.06 (2.92)	3.00 (2.68)						

GAI, Geriatric Anxiety Inventory; PSWQ, Penn State Worry Questionnaire; GDS-15, Geriatric Depression Scale

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (two-tailed)

Table 11.2 continued

Means (SD) for Primary Outcome Measures by Group at T0 and T4 and F-values as a Function of Time and Age of Onset

	Early-Onset (n = 18)	*Late-Onset (n = 23)*	*Time*		*Onset*		*Time x Onset*	
	M (SD)	*M (SD)*	$F_{[df]}$	η_p^2	$F_{[df]}$	η_p^2	$F_{[df]}$	η_p^2
Symptom Severity			$34.31_{[3.25, 126.87]}$***	.47	$1.65_{[1,39]}$	.04	$4.43_{[2.33, 90.75]}$*	.10
T1	3.21 (1.29)	4.21 (.80)						
T2	2.70 (1.11)	2.71 (.91)						
T3	2.25 (1.15)	2.41 (.71)						
T4	2.42 (1.13)	2.70 (1.34)						
Experience of Anxiety			$31.90_{[2.34, 98.18]}$***	.45	$.00_{[1,39]}$	.00	$.70_{[2.34, 98.18]}$	.02
T1	4.61 (1.24)	4.96 (1.36)						
T2	3.28 (1.18)	3.30 (1.22)						
T3	3.11 (1.28)	3.00 (1.09)						
T4	3.00 (1.28)	2.74 (1.39)						
Coping Ability			$28.74_{[2.76, 107.60]}$***	.42	$2.01_{[1,39]}$	.05	$.31_{[2.76, 107.60]}$	.01
T1	2.67 (.77)	2.30 (.70)						
T2	3.39 (.61)	3.22 (.67)						
T3	3.67 (.69)	3.48 (.51)						
T4	3.44 (.62)	3.30 (.88)						

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (two-tailed)

11.5.3.1 Anxiety

Figure 11.3 presents the mean anxiety scores for EO and LO groups across T0 to T4. The results revealed a large, significant main effect for time. On average, participants had an eight-point reduction in anxiety from pre-treatment to six-month post-treatment, as illustrated in Figure 11.3. The main effect of onset was non-significant, indicating that onset did not have a significant effect on overall mean anxiety scores. The interaction effect between time and onset was not statistically significant.

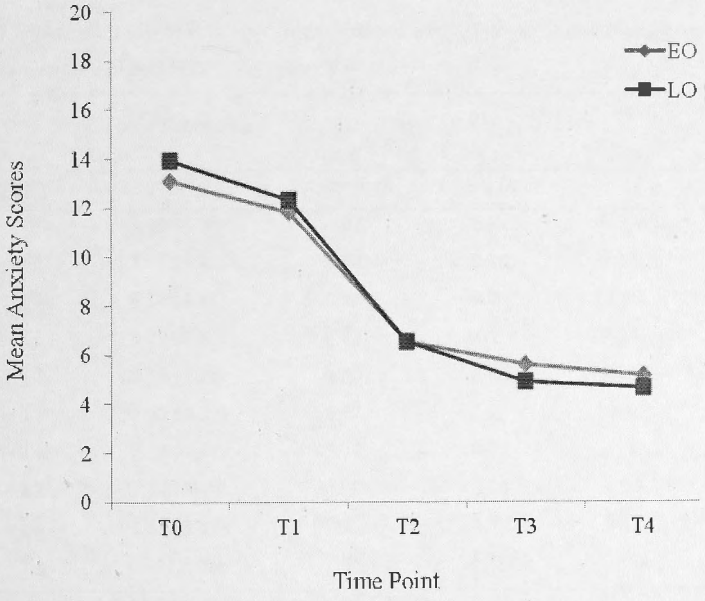


Figure 11.3. Mean Anxiety scores across T0 to T4 for EO and LO participants

Table 11.3 presents descriptive data for the mean difference in participants' anxiety scores between each time point and the significance of these differences. The results revealed a significant reduction in mean anxiety score from T0 to T2, T0 to T3 and T0 to T4. Similarly, there was a significant reduction in mean anxiety score from T1 to T2, T1 to T3 and T1 to T4. A significant reduction in mean level of anxiety was also found from T2 to T3 and T2 to T4. Anxiety scores were not found to significantly differ from T0 and, or from T3 to T4.

Table 11.3

Mean Difference (SD) in Anxiety Scores between each Time-point and Significance of Differences for EO and LO Participants (N = 41)

	Mean Difference	*95% CI*		*Significance Test*
Anxiety	*M (SD)*	*Lower limit*	*Upper limit*	$t_{[df]}$
T0 – T1	1.46 (4.70)	- .02	2.94	$1.99_{[40]}$
T0 – T2	7.02 (4.92)	5.47	8.60	$9.15_{[40]}$***
T0 – T3	8.37 (4.86)	6.83	9.90	$11.03_{[40]}$***
T0 – T4	8.71 (5.82)	6.87	10.54	$9.58_{[40]}$***
T1 – T2	5.56 (3.98)	4.30	6.82	$8.93_{[40]}$***
T1 – T3	6.90 (4.22)	5.57	8.23	$10.46_{[40]}$***
T1 – T4	7.24 (4.67)	5.77	8.72	$9.94_{[40]}$***
T2 – T3	1.34 (2.40)	.59	2.10	$3.56_{[40]}$***
T2 – T4	1.68 (3.47)	.60	2.77	$3.11_{[40]}$**
T3 – T4	.34 (3.76)	- .85	1.53	$.58_{[40]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (two-tailed)

11.5.3.2 Worry

The results revealed a substantial main effect for time, with both onset groups showing a significant reduction in worry scores across the five time periods (See Figure 11.4). On average, participants had a nineteen-point reduction in worry from T0 to T4. The main effect of onset was non-significant, indicating that onset did not have a statistically significant effect on overall mean worry scores. The change in worry scores at each time point did not differ between early-and late-onset groups, as confirmed by a non-significant interaction effect of time by onset.

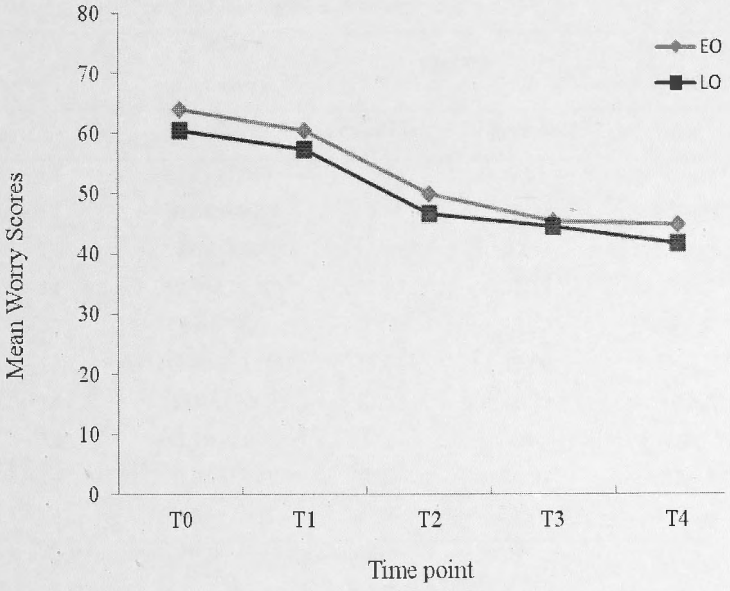


Figure 11.4. Mean Worry scores across T0 to T4 for EO and LO participants

Table 11.4 presents descriptive data for the mean difference in participants' worry scores between each time point and the significance of these differences. The results revealed a significant reduction in worry scores from T0 to T2, T0 to T3, and T0 to T4. In addition, there was a significant reduction in mean worry scores from T1 to T2, T1 to T3, and from T1 to T4. A significant reduction in worry score was also found from T2 to T3 and T2 to T4. Worry scores were not found differ from T0 to T1 or from T3 to T4.

Table 11.4

Mean Difference (SD) in Worry Scores between each Time-point and Significance of Differences for EO and LO Participants (N = 41)

	Mean Difference	*95% CI*		*Significance Test*
Worry	*M (SD)*	*Lower limit*	*Upper limit*	$t_{[df]}$
T0 – T1	3.27 (7.50)	.90	5.63	$2.79_{[40]}$**
T0 – T2	13.88 (10.25)	10.64	17.11	$8.67_{[40]}$***
T0 – T3	17.07 (10.90)	13.63	20.51	$10.02_{[40]}$***
T0 – T4	18.93 (10.32)	15.67	22.18	$11.75_{[40]}$***
T1 – T2	10.61 (9.22)	7.70	13.52	$7.36_{[40]}$***
T1 – T3	13.80 (10.10)	10.62	17.00	$8.75_{[40]}$***
T1 – T4	15.66 (9.93)	12.52	18.79	$10.10_{[40]}$***
T2 – T3	3.19 (4.00)	1.93	4.46	$5.11_{[40]}$***
T2 – T4	5.05 (7.13)	2.80	7.30	$4.53_{[40]}$**
T3 – T4	1.86 (7.45)	- .50	4.21	$1.59_{[40]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (two-tailed)

11.5.3.3 Depression

There was a significant main effect for time. The effect size for this main effect was quite large (see Table 11.2), with a significant reduction in depression scores from T0 to T4 for both onset groups, illustrated in Figure 11.5. On average, participants had a two-point reduction in depression from pre- treatment to six-months post- treatment. This effect was not due to age of onset. The interaction between time and onset was also non-significant, indicating that the difference in depression scores for EO and LO groups was the same at each time point.

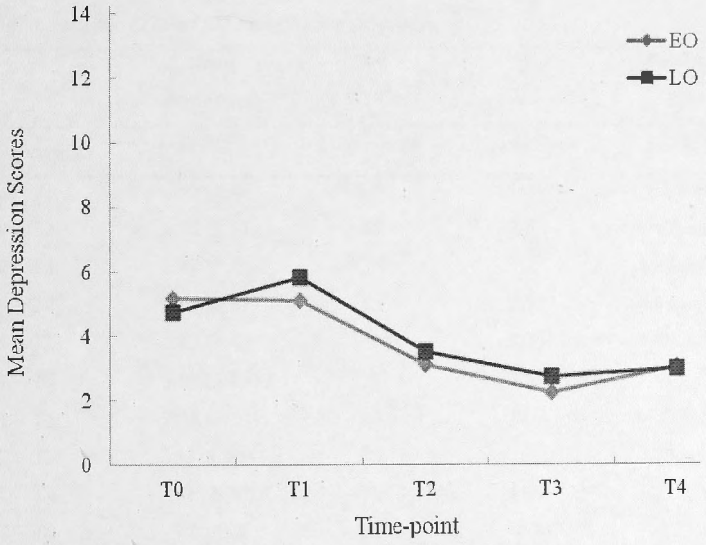


Figure 11.5. Mean Depression scores for EO and LO participants across T0 to T4

Table 11.5 presents descriptive data for the mean difference in participants' depression scores between each time point and the significance of these differences. Depression scores were not found to significantly differ from T0 to T1, T2 to T4, or T3 to T4. There was a significant reduction in mean depression scores from T0 to T2, T0 to T3 and T0 to T4. There was also a significant decrease in depression scores from T1 to T2, T1 to T3 and to T1 to T4. In addition, there was a significant reduction in mean depression score from T2 to T3.

Table 11.5

Mean Difference (SD) in Depression Scores between each Time-point and Significance of Differences for EO and LO Participants (N = 41)

	Mean Difference	*95% CI*		*Significance Test*
Depression	*M (SD)*	*Lower limit*	*Upper limit*	$t_{[df]}$
T0 – T1	- .58 (3.40)	- 1.66	.49	$-1.01_{[40]}$
T0 – T2	1.58 (3.11)	.60	2.57	$3.26_{[40]}$**
T0 – T3	2.41 (2.88)	1.50	3.23	$5.37_{[40]}$***
T0 – T4	1.90 (3.32)	.85	2.95	$3.66_{[40]}$***
T1 – T2	2.17 (3.40)	1.09	3.24	$4.09_{[40]}$***
T1 – T3	3.00 (3.24)	1.95	4.05	$5.78_{[40]}$***
T1 – T4	2.48 (2.53)	.39	1.69	$6.29_{[40]}$***
T2 – T3	.83 (1.50)	.35	1.30	$3.54_{[40]}$***
T2 – T4	.32 (2.80)	.56	1.20	$.73_{[40]}$
T3 – T4	-5.1 (2.62)	- 1.34	.31	$-1.25_{[40]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (two-tailed)

11.5.3.4 Participant-rated mean GAD symptom severity

The severity of DSM-IV symptoms of GAD experienced by participants was rated following the completion of each treatment component on a scale from zero to eight where 0 = "none" and 8 = "very severe". Participant-rated symptom severity scores were calculated by summing the scores for each of the six DSM-IV GAD symptoms rated, and dividing the summed score by the number of symptoms (6). Mean symptom severity across T1 to T4 was explored in order to investigate how symptom severity varied throughout and following treatment. There was a substantial main effect for time, with participants showing a significant reduction in mean symptom severity from T1 to six-month follow-up, illustrated in Figure 11.6. Onset was not found to have a significant effect on overall mean symptom severity, as confirmed by a non-significant main effect of onset

There was however a moderately large, significant interaction effect between age of onset and time, indicating that the rate of reduction in mean GAD symptom severity scores for EO and LO participants differed across time. Consideration of the mean GAD symptom severity scores presented in Figure 11.6 illustrates that LO participants had a significantly greater reduction in mean symptom severity score from T1 to T2 (M = -1.50, SD = .74) than EO participants (M = -.51, SD = 1.08), confirmed by an independent-samples t-test, $t(39) = 3.48$, $p \leq .01$. The change in mean severity scores did not significantly differ between EO and LO groups from T2 to T3 (EO: M = -.45, SD = .49; LO: M = -.30, SD = .42), $t(35.42) = 1.10$ $p > .05$, equal variances not assumed ($F = 8.55$, $p < .05$), or from T3 to T4 (EO: M = .17, SD = .70; LO: M = .29, SD = 1.27), $t(39) = .39$, $p > .05$.

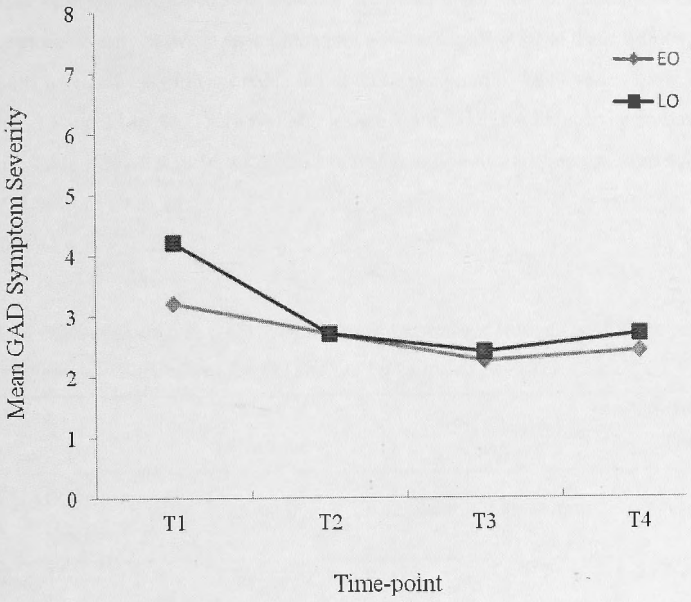


Figure 11.6. Mean GAD symptom severity scores across T1 to T4 for EO and LO participants

Table 11.6 presents descriptive data for the mean difference in participant-rated GAD symptom severity between each time point and the significance of these differences. The results revealed a significant reduction in mean symptom severity scores from T1 to T2, T1 to T3 and T1 to T4. There was also a significant reduction in mean symptom severity from T2 to T3. No significant difference was found in mean symptom severity from T2 to T4 or from T3 to T4.

Table 11.6

Mean Difference (SD) in GAD Symptom Severity Ratings between each Time-point and Significance of Differences for EO and LO Participants (N = 41)

	Mean Difference	95% CI		Significance Test
GAD symptom severity	M (SD)	Lower limit	Upper limit	$t_{[df]}$
T1 – T2	1.06 (1.02)	.74	1.39	$6.67_{[40]}$***
T1 – T3	1.43 (.88)	1.15	1.71	$10.45_{[40]}$***
T1 – T4	1.19 (1.19)	.82	1.57	$6.45_{[40]}$***
T2 – T3	.37 (.45)	.22	.51	$5.20_{[40]}$***
T2 – T4	.13 (1.08)	-.21	.47	$.77_{[40]}$
T3 – T4	-.24 (1.05)	-.57	.09	$-1.44_{[40]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$(two-tailed)

11.5.3.5 Participants-rated level of anxiety

Overall level/experience of anxiety was also evaluated by participants at the completion of each CBT treatment module using a rating scale of zero to eight where 0 = "no anxiety" and 8 = "very severe anxiety". The results revealed a large and significant main effect for time (see Table 11.2). On average, participant-rated levels of anxiety decreased by an average of two points from pre- to post treatment, illustrated in Figure 11.7.

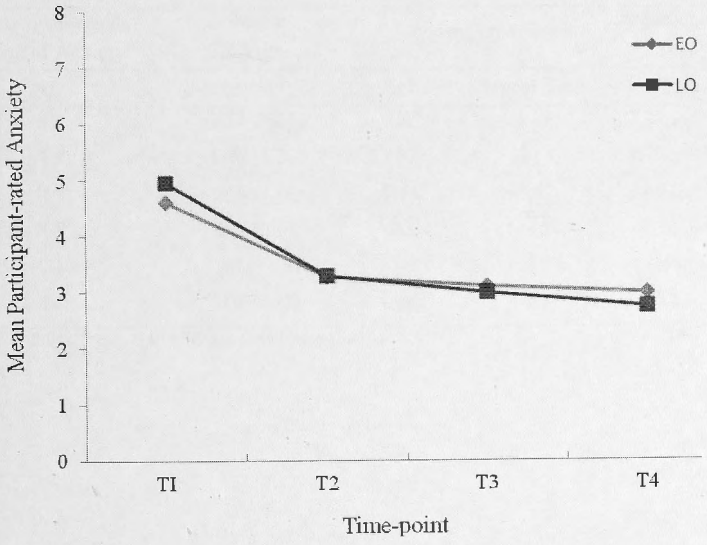


Figure 11.7. Participant-rated level of mean anxiety severity across T1 to T4 for EO and LO participants

Table 11.7 presents descriptive data for the mean difference in participant-rated levels of anxiety between each time point and the significance of these differences. There was a significant reduction in mean participant-rated anxiety levels from T1 to T2, T1 to T3, T1 to T4 and T2 to T3. No significant difference was found in mean anxiety ratings from, T2 to T4 or T3 to T4.

Table 11.7

Mean Difference (SD) in Participant-rated Levels of Anxiety between each Time-point and Significance of Differences for EO and LO Participants (N = 41)

Participant-rated Level of Anxiety	Mean Difference	95% CI		Significance Test
	M (SD)	Lower limit	Upper limit	$t_{[df]}$
T1 – T2	1.51 (1.34)	1.1	1.94	$7.21_{[40]}$***
T1 – T3	1.76 (1.22)	1.37	2.14	$9.22_{[40]}$***
T1 – T4	1.95 (1.63)	1.44	2.47	$7.68_{[40]}$***
T2 – T3	.24 (.66)	.03	.45	$2.36_{[40]}$*
T2 – T4	.44 (1.67)	-.09	.97	$1.68_{[40]}$
T3 – T4	.19 (1.52)	-.28	.67	$.82_{[40]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$(two-tailed)

11.5.3.6 Participant-rated ability to cope with anxiety and/or worry

Ability to cope with anxiety was rated by participants across the three treatment periods and at six-month follow-up (T1 to T4), on a five-point scale from one to five, where 1 = "poor" and 5 = "excellent." The results revealed that there was a significant main effect of time. This effect was quite large (see Table 11.2), with participants' ability to cope improving by an average of one point over time (see Figure 11.8).

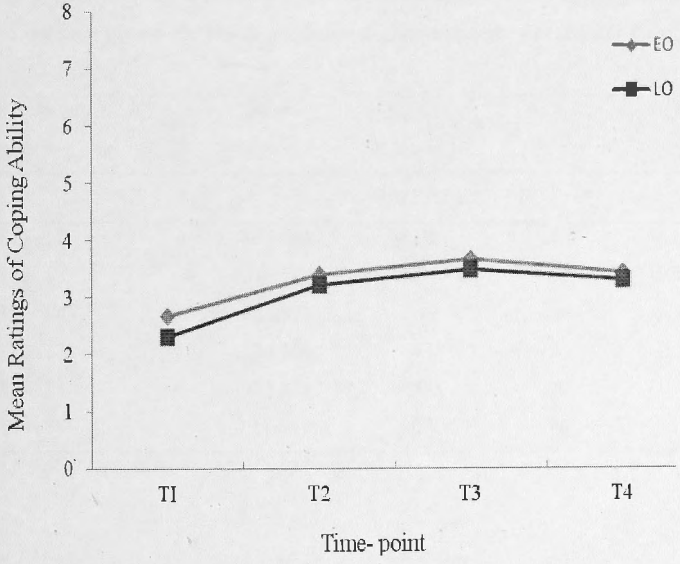


Figure 11.8. Mean participant-rated ability to cope with anxiety symptoms

Table 11.8 presents descriptive data for the mean difference in participant-rated ability to cope with anxiety between each time point and the significance of these differences. There was a significant increase in participant ratings of coping ability from T1 to T2, T1 to T3 and T1 to T4. There was also a significant increase in mean ratings of ability to cope from T2 to T3. Mean ratings of ability to cope were not found to differ from T2 to T4, or from and T3 to T4.

Table 11.8

Mean Difference (SD) in Participant-rated Evaluations of Ability to Cope with Anxiety between each Time-point and Significance of Differences for EO and LO Participants (N = 41)

Participant-rated Ability to Cope	*Mean Difference*	*95% CI*		*Significance Test*
	M (SD)	*Lower limit*	*Upper limit*	$t_{[df]}$
T1 – T2	-.83 (.80)	-1.08	-.57	$-6.61_{[40]}$***
T1 – T3	-1.10 (.77)	-1.34	.85	$-9.15_{[40]}$***
T1 – T4	-.90 (.92)	-1.19	-.61	$-6.30_{[40]}$***
T2 – T3	-.27 (.50)	-.43	-.11	$-3.40_{[40]}$**
T2 – T4	-.07 (.87)	-.35	.20	$-.53_{[40]}$
T3 – T4	.19 (.84)	-.07	.46	$1.48_{[40]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$(two-tailed)

11.5.3.7 Participant-rated evaluations of the 'usefulness' of CBT techniques learnt in managing anxiety

Participant-rated perceptions of the 'usefulness' of the skills learnt in each treatment module in helping to manage anxiety were evaluated by participants at the conclusion of each treatment module and at six-month follow-up (T1 through to T4). 'Usefulness' of each treatment module and of the overall treatment program were rated on a scale from 0 = 'not at all helpful' to 8 = 'very helpful.' Independent-samples t-tests were performed to determine whether onset groups differed in evaluations of the perceived usefulness of specific CBT treatment techniques in managing anxiety. Descriptive statistics for mean ratings of each of these treatment components and the results of these analyses are presented in Table 11.9. Comparison of means using independent-samples t-tests revealed that onset groups did not significantly differ in mean ratings of the usefulness of somatic control exercises, cognitive skills, behavioural skills and the treatment program overall, in managing their anxiety.

Table 11.9

Descriptive Statistics for Participant-rated Evaluations of the Usefulness of CBT Techniques from T0 to T4

	Early onset (N=18)		*Late onset (N = 23)*		*Significance test*
Time Point	*M*	*SD*	*M*	*SD*	$t_{[df]}$
T1 - Somatic control techniques	4.83	1.47	3.96	1.55	$1.84_{[39]}$
T2 - Cognitive techniques	6.17	1.04	5.83	1.40	$0.86_{[39]}$
T3 - Behavioural techniques	5.17	1.34	5.17	1.30	$-0.02_{[39]}$
T4 - CBT programme overall	6.28	1.60	5.91	1.47	$0.76_{[39]}$

$^{*}p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$

11.5.4 Secondary Treatment Outcomes

Measures of trait-anxiety (STAI-T), anxiety sensitivity (ASI), self-efficacy (SES) and perceptions of anxiety control (ACQ) were completed by participants at initial assessment and again at six-month follow-up (see Figure 11.10). Mixed between-within subjects ANOVAs were performed to investigate the main effect of time, of age at onset and the interaction between time and onset for these outcome measures. The ANOVA test assumption of homogeneity of variance (sphericity) was met for all main effects and interactions. Levene's test for equality of variance was significant for scores on the general subscale of the SES at T0, indicating non-equal variances for onset groups on this variable ($F (1, 39) = 4.94$, $p < .05$). Inspection of the group statistics revealed a greater variance in scores for the EO group than the LO group at T0, also reflected in a greater range of scores on the scale for the EO group at T0. As the scores on these scales for both groups were otherwise normally distributed, and Levene's test was significant only at this point, a decision was made not to transform the data. Descriptive data for these secondary outcome measures by group and the results of these analyses are presented in Table 11.10

Table 11.10

Means (SD) for Secondary Outcome Measures by Group at T0 and T4 and F-values as a Function of Time and Age of Onset

	Early onset (N=18)	*Late onset (N = 23)*	*Time*		*Onset*		*Time x Onset*	
	M (SD)	*M (SD)*	$F_{[df]}$	η_p^2	$F_{[df]}$	η_p^2	$F_{[df]}$	η_p^2
STAI-T			$54.68_{[1,39]}$***	.58	$.08_{[1,39]}$	.002	$.01_{[1,39]}$	.00
T0	50.28 (10.70)	50.87 (9.59)						
T4	40.44 (8.17)	41.35 (8.54)						
ASI			$36.41_{[1,39]}$***	.48	$.05_{[1,39]}$	.00	$.03_{[1,39]}$	.001
T0	33.78 (12.06)	33.65 (14.62)						
T4	20.80 (9.04)	21.48 (13.70)						
SES – General			$13.30_{[1,39]}$***	.25	$.84_{[1,39]}$	.02	$.01_{[1,39]}$	.01
T0	53.83 (14.79)	51.13 (9.68)						
T4	60.56 (11.45)	57.52 (10.07)						
SES – Social			$11.05_{[1,39]}$*	.22	$.01_{[1,39]}$	.00	$.01_{[1,39]}$	.01
T0	17.78 (4.92)	17.91 (4.21)						
T4	19.94 (14.96)	19.52 (3.40)						
ACQ			$53.62_{[1,39]}$***	.58	$.37_{[1,39]}$	.01	$1.98_{[1,39]}$	.05
T0	69.22 (17.85)	69.96 (17.88)						
T4	92.50 (15.37)	85.74 (19.56)						

STAI-T, Trait Anxiety; ASI, Anxiety Sensitivity Index; SES, Self Efficacy Scale; ACQ, Anxiety Control Questionnaire

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

The results revealed a statistically significant main effect of time for all four secondary outcome measures, with participants reporting significant reductions in trait anxiety (STAI-T) and anxiety sensitivity (ASI) and significant improvements in general (GSE) and social (SSE) self efficacy, and perceptions of anxiety control (ACQ). The effect size for these findings were considerably large (see Table 11.10). On average, participants had a ten-point reduction in trait anxiety, a twelve-point reduction in anxiety sensitivity, a six-point improvement in general self-efficacy and a 20-point improvement in perceptions of anxiety control from pre- treatment to six- months post- treatment. These effects were not related to age of onset and nor was there a difference between onset groups in the rate of improvement in these outcomes, as reflected in a non-significant effect between time and age of onset for these four outcome measures.

11.6 Discussion

The experience of anxiety, worry and depression, in addition to levels of participant-rated GAD symptom severity, anxiety, coping with anxiety and ratings of the usefulness of treatment techniques were investigated in the present study to determine whether i) treatment/time had an effect on levels of these variables; ii) age of onset had an effect levels of these dependent variables, and; iii) whether the influence of onset on levels of the dependent variable depends on treatment component/time. An additional aim of the study was to determine whether improvements made on outcome measures following treatment were maintained at six-month follow-up.

The hypothesis that CBT for late-life GAD would result in a significant improvement in levels of the primary and secondary outcome measures over the course of treatment was supported by the current data. Treatment was found to be effective in significantly reducing levels of anxiety, worry and depression as well as the severity of GAD symptoms in the current sample of older adults from pre- to post-treatment, and resulted in significant improvements in participant-rated levels of anxiety and ability to cope. The current findings are in line with previous research reporting significant improvements on self-rated measures of anxiety, worry and depression in studies of CBT for older adults aged 55 and over with GAD (Barrowclough, et al., 2001; Gorenstein, et al., 1999; King & Barrowclough, 1991; Mohlman, et al., 2003; Stanley, Beck, & Glassco, 1996; Stanley, Beck, et al., 2003; Wetherell, Gatz, et al., 2003; Wetherell, Sorrell, et al., 2005).

Regarding this finding of a significant main effect of time for all outcome measures, Bonferroni corrected post-hoc tests were examined to determine at what time points differences occurred. Paired-samples t-tests revealed that anxiety, worry and depression scores did not differ between initial assessment and completion of the relaxation skills component (from T0 to T1), nor between completion of treatment and six-month follow-up (from T3 to T4). Additionally, depression scores were not found to differ from T2, following completion of the cognitive skills module, to T4, at six-month follow-up. All remaining tests were significant, with a reduction in anxiety, worry and depression scores from T0 to T2, T3 and T4, from T1 to T2, T3, and T4, from T2 to T3 and from T2 to T4. Participant-rated GAD symptom severity, experience of anxiety and coping with anxiety were all found to significantly improve from T1 to T2, T1 to T3 and T1 to T4. GAD symptom severity and ability to cope with anxiety were also found to improve from T2 to T3, whilst participant-rated anxiety did not differ from T2 to T3. Symptom severity, experience of anxiety and coping ratings were not found to differ from T2 to T4 or from T3 to T4.

The finding that participants' scores on measures of anxiety, worry and depression did not significantly differ from T0 to T1 but did so from T1 to T2, in addition to T0 to T2, suggests that the reduction in these scores may be attributable to the cognitive skills component of treatment, rather than a combination of these two components of treatment. Although data for participant-rated symptom severity, levels of anxiety and ability to cope with anxiety were not available for T0, findings of a significant improvement in these outcome measures between T1 and T2 further supports the contribution of cognitive therapy techniques to positive treatment outcome. The improvement on primary outcome measures from T1 to T3 and from T1 to T4 indicate that both the cognitive and behavioural components combined had a positive effect on outcome at the end of treatment and at 6-month follow-up. The improvement on outcome measures from T2 to T3 and T2 to T4 indicates that the behavioural skills component had a further positive impact on outcome measures at the end of treatment, which was maintained at follow-up. It is important to note that components of CBT were not administered in a counterbalanced order. Therefore, it may be that the current findings were due to the additive effects of CBT, rather than due to the cognitive skills component alone.

Investigation of the relationship between age of onset and levels of the primary and secondary outcome measures revealed that age at onset did not have a significant effect on overall mean psychopathology scores, symptom severity, self-rated levels of anxiety, or ability to cope with anxiety symptoms. Investigation of between-group differences also showed that onset groups did not significantly differ in their evaluations of the usefulness of each CBT treatment module, or the treatment programme overall, in managing their symptoms of GAD. The finding of a non-significant main effect of onset is in contrast to previous findings in the depression literature suggesting that EO late-life depression is more difficult to treat than LO of depression (Brodaty, et al., 2001; Dew, et al., 1997; Reynolds, et al., 1998). The findings of Driscoll et al. (2005) that LO depression does not lead to worse treatment outcome, but rather, that more sessions are required to achieve the same outcome as those in the EO group were also not supported by the current findings. Although time to respond was not specifically investigated in the current investigation, all participants took part in the same number of sessions and were found to demonstrate similar improvements on self-report measures of psychopathology and participant-rated evaluations of symptom severity, anxiety and coping. As such, the conclusion that late age of onset may be associated with longer time to respond is not supported by the current findings. The current findings are however in line with findings of Barzega et al. (2001), who found no significant difference in response to treatment between older adults with EO and LO dysthymia.

The hypotheses that EO participants would respond better to CT techniques than those with LO GAD (Hypothesis 2a) and that LO participants would respond to BT techniques better than those with EO GAD (Hypothesis 2b) were not supported by the current data. With the exception of a significant interaction effect for mean participant-rated GAD symptom severity, early-and late-onset participants were not found to differ in levels of the dependent variables measured over time. On average, LO participants reported significantly greater symptom severity at T1 than EO participants. There was also a significantly greater reduction in mean symptom severity from T1 to T2 for LO participants than for those with EO GAD. The difference in mean symptom severity ratings for onset groups was similar at the remaining time points (T2 through to T4). It may be that as many of the participants in the LO group had a relatively recent onset of GAD with a shorter illness duration, participants in the LO group perceived their symptoms as more severe at initial assessment. On the other hand, due to the long and chronic illness course experienced by those with EO of GAD, it may be that participants

in the EO group may be accustomed to the experience of these symptoms, which may account for the difference in symptom severity found between groups at T1.

The current findings indicate that cognitive techniques have an important role in the treatment of anxiety in older adults regardless of age at onset. These findings do not support the proposal that cognitive techniques may have a more important role in the treatment of those with EO of anxiety than those with LO anxiety (Wetherell, Hopko, et al., 2005). Although participants with LO GAD were found to have a shorter duration of illness (see Chapter Eight) it would seem that once developed, the faulty cognitions that are characteristic of GAD are equally as entrenched for those with LO GAD as for those with EO of GAD. Consequently, CT techniques appear to be equally as important in the treatment of LO GAD as for EO GAD. Furthermore, despite a significant difference between onset groups in chronicity, with those in the EO group previously being found to have a greater number of episodes of psychiatric illness and greater duration of illness since initial onset (see Study One, Chapter Eight), the current findings indicate that behavioural techniques are no less important for the treatment of those with EO GAD than LO GAD. These findings do not support the suggestion put forward by Beck and Stanley (1997) that behavioural treatment may be less efficacious for those with EO of anxiety.

The finding that onset groups did not differ in their evaluations of the usefulness of each treatment module is also in contrast to the hypothesised relationship between treatment and age of onset. The current findings are in line with earlier findings presented in Section One of this thesis (see Chapter Nine), showing that onset groups did not differ in the frequency or severity of GAD- related worries, the frequency or severity of GAD symptoms, or on self-rated measures of anxiety, worry and depression at initial assessment. As such, it may be that similarity in certain phenomenological aspects of GAD between EO and LO participants at pre-treatment may also be indicative of treatment outcome. Given that treatment components were not directly compared to one another, it would be informative to analyse components of CBT separately in future research to further investigate the hypotheses of differential efficacy of CBT components for older adults with EO and LO GAD in future research.

The current data revealed that improvements in anxiety, worry and depression scores and participant-rated symptom severity, levels of anxiety and ability to cope with anxiety at the completion of treatment were maintained at six-month follow-up. These improvements and maintenance of treatment gains was similar for both EO and LO groups of older adults with either a principal or co-principal diagnosis of GAD. There was a small but non-significant further reduction in anxiety and worry levels and in participant-rated experience of anxiety from T3 to T4. This further improvement may have reached significance for the LO group however mean anxiety and worry scores at T4 were influenced by two individuals in the LO group who had a relapse in their anxiety condition/GAD, as reflected in increased anxiety and worry symptoms at T4. On the other hand, there was a small but non-significant increase in mean symptom severity from T3 to T4 and a reduction in ability to cope with anxiety following improvements from T1 to T3. This was slightly greater for EO group. Inspection of the distributions of these variables indicates that this was because two individuals in the EO group and one in the LO group relapsed at T4.

The finding that, on average, both onset groups maintained treatment gains at six-month follow-up is in contrast to previous findings indicating that older adults with EO depression have a shorter time to relapse (Gollan, et al., 2005) and have higher rates of relapse than those with LO depression (Brodaty, et al., 2001). As previously noted by Reynolds et al. (1998) who did not find age at onset of first lifetime episode of recurrent major depression to affect absolute rates of relapse or recurrence during the first year of maintenance therapy, older patients with EO depression did not differ from those with LO in treatment intensity or focus, either pharmacological or psychotherapeutic. Reynolds and colleagues suggest that the similarity of combined treatment received was the strongest determinant of similar outcomes found for onset groups. As with the present investigation, older adults with early-and late-onset GAD took part in the same treatment program with the same treatment components for the same duration, which may have contributed to the similarity in outcomes for both onset groups. Further longitudinal follow-up is required to examine this further.

11.7 Conclusions

In summary, participants with early-and late-onset GAD in late-life showed significant improvement in levels of anxiety, worry, depression, participant-rated GAD severity, anxiety and ability to cope with anxiety over time/treatment. In addition, participants' levels of trait-anxiety, anxiety sensitivity, self-efficacy and perceptions of control over anxiety-related symptoms significantly improved from pre- to post-treatment. The findings of the current investigation revealed that a distinction in age at onset of late-life GAD did not have any significant treatment implications. Participants with early- and late-onset of GAD were found to be similar with regard to treatment outcome and response on all outcome measures, with treatment gains being maintained by participants at six-month follow-up. The hypotheses that cognitive therapy techniques would be more efficacious in the treatment of EO GAD and be associated with a greater change on outcome measures for those with EO GAD, and; that participants with LO GAD would have a better response to behavioural techniques than those with EO GAD were not supported by the current data. Both early- and late-onset participants demonstrated similar improvements on outcome measures following somatic, cognitive and behavioural treatment modules. Overall these findings suggest that age of onset is not a significant factor as to treatment outcome. Furthermore, the current findings indicate that older adults with EO and LO of GAD can expect similar treatment outcomes in response to a full package of CBT including all three of these treatment components, regardless of this differentiating factor.

CHAPTER TWELVE

General Discussion

The present study is one of the first and most comprehensive attempts to outline and apply a statistical methodology for identifying whether there exists two subgroups of older adults with early-and late-onset anxiety and to determine a cut-off point for best deciding to which subpopulation a given age of onset belongs. Aetiological and phenomenological factors associated with early- and late-onset GAD in a sample of older adults were also examined. In addition, the relationship between the experience of negative life events and age at onset of GAD was investigated. Finally, psychological wellbeing before, during and six months following CBT treatment was intensively examined. The results highlighted the importance of understanding the role of age at onset in the experience and treatment of late-life GAD and as such, offer numerous significant theoretical and clinical implications.

12.1 Study One

12.1.1 Research Question 1: Is there an Empirically Identifiable Cut-off Age that Differentiates EO GAD from LO GAD?

In terms of the theoretical implications, the present study is the first of its kind to investigate the theoretical conceptualization and empirical measurement of a bimodal distribution of age at onset of GAD. The onset of current and lifetime episodes of DSM-IV anxiety disorders was assessed in the present study in order to investigate whether there exists two sub-populations of older adults representing a group with "early onset," (EO) and a group with "late onset" (LO) of anxiety. Descriptive analyses of the sample revealed that the majority of participants had a primary diagnosis of GAD at evaluation and for GAD to be the most commonly diagnosed anxiety disorder at first onset of a DSM-IV anxiety disorder and DSM-IV disorder of any kind. A maximum-likelihood estimation procedure used to apply gamma probability density function (pdf) distributions to the data revealed a bimodal distribution for first lifetime onset of a DSM-IV anxiety disorder. A cut-off of 34.4 years was identified as the point at which the probability that a given age of onset belonged to either subpopulation would be identical. Accordingly, participants identified as having an onset of GAD prior to and including 34 years of age in the present study were classified as having an EO disorder.

Participants with an onset of GAD at 35 years or later were identified as belonging to the LO group.

The statistical procedure used to determine modality of the attained distribution of onset represents a significant advancement on previous research. Past research has tended to select an arbitrary cut-off age for the determination of age of onset, with cut-off points ranging from fifteen years (Beck et al.,1996) to fifty years (Chou, 2009; Le Roux et al., 2005) in studies of late-life GAD. Previous research has also varied in the methodology used in eliciting age of onset, with a number of investigations assessing onset of the current episode rather than lifetime episodes of illness onset. This has led to a lack of clarity as to whether 'late-onset' refers to the onset of a disorder for the first time in late life without a prior history of illness, or merely the first onset to occur in late life after a threshold selected by the researcher. It is therefore likely that the results of past research may be misleading due to the failure to assess lifetime episodes of psychiatric illness, lack of clarity about definitions of 'age at onset' and inconsistency in the cut-off selected to determine onset groups across the research literature. The methodology used in the present study presents a means of identifying a cut-off specific to the sample which is highly accurate and minimises the probability of misclassification that may result when an arbitrary cut-off is selected by the researcher. The results indicate that a more accurate conceptualization and measurement of age at onset is a priority for future research, and that future research considers the use of a standard methodology such as the statistical method used here to examine age of onset in a given population.

12.1.2 Research Question 2: What are the Aetiological Differences between Older Adults with EO and LO GAD?

The present study has significantly extended the existing knowledge regarding the relationship between age at onset and the aetiology of late-life GAD. Investigating aetiological differences between early-and late-onset GAD is important not only in clarifying the dimensions by which EO and LO GAD may be differentiated, but in helping to identify factors to be addressed in education, early-intervention and prevention programs for GAD. The sample of early- and late-onset participants was similar in terms of demographic characteristics, consistent with previous research (Beck et al., 1996; Chou, 2009; Le Roux et al., 2005). Participants were also found to be homogeneous with regard to health characteristics including the number and types of

health conditions reported, in line with previous findings (Chou, 2009; Le Roux et al., 2005). With the exception of a small but significant finding for greater use of benzodiazepines and health supplements amongst EO participants, prescription and non-prescription medication use was also found to be similar between onset groups. Onset groups were not found to differ with regards to age at which they first sought treatment for a psychiatric problem, nor in terms of a history of psychotherapeutic and/or psychotropic treatment sought prior to the present investigation, consistent with previous findings (Le Roux et al., 2005). EO GAD was, however, found to be characterised by greater chronicity, as reflected in a significantly longer course of illness since initial onset and a greater number of episodes of psychiatric illness (i.e. discrete episodes of anxiety and/or depression). These findings are as expected given the much younger mean age at onset of first anxiety episode for EO participants, and are consistent with previous findings of late-life GAD (Beck et al., 1996; Le Roux et al., 2005).

Investigation of genetic factors also revealed a significant difference between onset groups for a positive family history of psychiatric illness, with a significantly greater proportion of EO participants reporting their mothers to have a history of psychiatric illness than LO participants. These findings suggest that EO GAD may be related to a psychobiological (genetic) vulnerability. Although the relationship between a family history of psychiatric illness and age at onset of GAD has not previously been investigated, the current findings are supported by previous investigations in the depression (Brodaty et al., 2001; Devanand et al., 2004) and panic disorder (Sheikh et al., 2004) literature. These findings suggest the need for early intervention, including more education and support, for individuals identified with a family history of psychiatric illness.

The finding of significantly greater benzodiazepine use amongst EO participants compared to those with LO GAD suggests that older adults with a longer history of anxiety may be receiving less effective treatment than those with a more recent onset of anxiety and that over the long-term, EO GAD is poorly managed. The longer history of anxiety characterised by multiple episodes of psychiatric illness found to be associated with EO GAD may contribute to increased hopelessness about improvement amongst these individuals, which may further perpetuate the use of benzodiazepines amongst EO participants. The implications of ongoing benzodiazepine use over a number of years

may include dependence, which is common with this class of drugs. Amongst aging individuals ongoing use may have further adverse consequences. For example, as previously noted, benzodiazepine use in older adults has been associated with increased risk of hip fracture (Ray, et al., 1989), sedation, falls, confusion and memory impairment, even at low doses (Schneider, 1996; Wengel, et al., 1993). Despite their disadvantages and limitations in safe use among older adults, benzodiazepines have remained the treatments of choice for acute or sub-acute anxiety amongst medical practitioners (Schneider, 1996). Accordingly, the current findings suggest the need for education amongst the medical community regarding the first line management of anxious presentations that doctors and G.P's may come across in their areas of practice.

Overall, the current findings suggest that benzodiazepine use, the use of health supplements, illness duration, number of episodes of psychiatric illness and a positive family history of anxiety are the distinguishing aetiological factors between early- and late- onset GAD. Accordingly, these factors highlight areas of need with regard to early intervention and therefore the management of EO GAD.

12.1.3 Research Question 3: What are the phenomenological differences between older adults with EO and LO GAD?

Phenomenological differences between older adults with EO and LO GAD have not been well examined in past research, with previous investigations focusing on differences in scores on psychological inventories as a measure of difference (Beck et al., 1996; Hoehn-Saric et al., 1993; Le Roux et al., 2005). Furthermore, previous findings in both the depression (Brodaty et al., 2001) and panic (Battaglia, et al., 1995; Sheikh, et al., 1991; Sheikh, et al., 2004) literature have been inconsistent. Investigating phenomenological differences between EO and LO GAD is therefore important, not only in extending the current knowledge regarding such differences but also because of potential implications for the clinical treatment of early-and late-onset GAD.

Participants in both onset groups met criteria for a wide range of comorbid psychiatric conditions at all assessment points. Onset groups were not, however, found to differ in rates of psychiatric comorbidity at presentation, at first onset of a DSM-IV disorder of any kind, nor at first onset of a DSM-IV anxiety disorder. Findings of non-significance between onset groups in psychiatric comorbidity using a cut-off of 34 are in line with

previous findings in the panic disorder literature (Sheikh et al, 2004). On the other hand, findings of significance using a cut-off of 50 are supported by previous findings using a similar age-cut-off (Chou, 2009; Le Roux et al., 2005), with both Chou and Le Roux and colleagues finding that EO GAD patients were significantly more likely to report psychiatric comorbidity than those with LO GAD.

Overall, participants were similar with regard to the frequency and severity of GAD-related worries, in line with previous findings (Beck et al., 1996). With exception of the symptom "feelings of restlessness, keyed up and/or being on edge", which was rated as significantly more severe by participants with EO GAD than those with LO GAD, onset groups did not significantly differ with regard to the frequency and severity of GAD-related symptoms experienced. In line with this, onset groups were not found to significantly differ in scores on self-reported measures of anxiety, worry, or depression. Although differences in the frequency and severity of GAD-related symptoms in EO and LO groups of older adults have not been previously examined, the current findings are supported by previous investigations of an onset distinction in the PD (Raj et al., 1993; Sheikh et al., 2004) and depression (Brodaty et al., 2001) literature. These previous findings suggest that there are few differences between EO and LO panic and depression in terms of phenomenology. In line with the conclusion of Brodaty et al. (2001) that "once expressed, the phenomenology [of a disorder] is stereotyped" (pp.234), the current findings suggest that once GAD has developed, the symptoms experienced by older adults are similar, regardless of age of onset. Furthermore, in line with these conclusions, given that participants in both the early-and late-onset subgroups have had GAD symptomatology for a number of years, it is unlikely that age at onset is central to symptom severity in older adults with clinical levels of anxiety. The findings that onset groups were broadly similar with regard to symptom frequency and severity indicate that the impact of LO GAD is as serious as that of EO GAD and should not be considered a 'normal part of aging'.

Participants with EO GAD spent a significantly greater percentage of time worrying each day, were rated as being significantly more distressed due to symptoms of GAD and had greater interviewer-rated severity of GAD than LO participants. Participants did not, however, differ with regard to level of interference in daily life due to symptoms of GAD. The current findings suggest that whilst participants do not differ regarding GAD symptom severity, they do with overall syndrome severity. As such,

although percentage of time worrying, distress and interference have not previously been investigated in studies of an onset distinction, the current findings indicate that the greater chronicty of EO GAD, as reflected in a significantly greater number of discrete episodes of anxiety and greater duration of illness since initial onset (See Research Question 2, Chapter Eight), may contribute to the findings of greater distress, time spent worrying, and overall severity of GAD observed in these individuals. Further investigation is required to examine the role of these variables in the phenomenology of late-life GAD.

Participants with LO GAD were found to have poorer self-perceived health and report greater functional limitations than those with EO GAD. These findings may have important implications for the identification and treatment of GAD. Previous findings of greater functional limitations amongst those with LO GAD (Chou, 2009; Le Roux et al., 2005) have led Le Roux and colleagues to suggest that disability may be a risk factor for the development of GAD in later life. Accordingly, functional impairment and self-perceived health, which have also been found to be worse amongst those with LO GAD (Chou, 2009), may be markers for LO GAD. The assessment of functional limitations and perceived health by GP's may help to identify those with, or those at risk of developing LO GAD. This would therefore facilitate early intervention and contribute to reducing the burden of disease and disability currently associated with anxiety amongst older adults.

12.1.4 Research Question 4: What are the Differences between Older Adults with EO and LO GAD in the Frequency and Severity of Stressful Life Events Preceding the Onset of Anxiety?

The present study is one of the first of its kind to investigate the theoretical conceptualization and empirical measurement of a diathesis-stress model to account for a distinction in age at onset of late-life GAD. Despite previous research indicating that stressful life events precede episodes of anxiety disorders (Faravelli, 1985; Finlay-Jones & Brown, 1981), relatively little is known about the relationship between stressful life events and anxiety in older adults (Kendler et al., 2003). Given the role of negative events in the onset of psychopathology, it is therefore important to investigate the role of the stress-diathesis interaction in the onset of GAD. A greater understanding of the

environmental precipitants to the onset of GAD will further help to inform early-intervention and the treatment of late-life GAD.

The current investigation revealed that EO and LO participants with a principal or co-principal diagnosis of GAD were similar with respect to the frequency and severity of stressful life events reported to precede the onset of the presenting episode of GAD. On the other hand, participants with LO GAD reported a greater frequency and severity of both health-related stressful events and difficult financial circumstances preceding first onset of GAD, in addition to greater severity of events involving change in education and/or occupation prior to first onset of GAD than those with EO GAD. These findings are in line with the cognitive model put forth by Boyd et al. (2001), proposing that LO of psychopathology is associated with the experience of more environmental stressors preceding episode onset. The present data are supported by previous findings in the panic literature, in which older adults with LO PD have been found to cite medical events as well as financial and interpersonal problems as stressors occurring prior to episode onset (Raj et al., 1993).

The finding that negative health-related events preceded the first onset of GAD for LO participants' has significant clinical implications. The knowledge that the experience of negative health-related events in later life affects psychological wellbeing means that medical professionals and psychologists may offer appropriate support to prevent declines in psychological wellbeing related to these changes. This might involve providing adequate education to individuals in the lead up to an upcoming surgery, for example knee replacement surgery or heart surgery, or following an unexpected health event, including a realistic timeframe for rehabilitation and what this would involve. This might also involve short-term therapy to monitor patients' levels of distress and to provide support to reduce this distress in the lead up to a health event if it is known, and/or after the incidence of a significant health-related event. This may serve to improve coping with stressful health-related events and to prevent the likelihood of either developing or continued experience of poor psychological wellbeing after such an event.

In line with this finding is the previous finding that participants with LO GAD report significantly greater functional limitations and poorer perceptions of their health than those with EO GAD (Research Question 3, Chapter Nine and discussed above), which

may be a result of the experience of negative health-related events. As such, appropriate education and early intervention may better prepare older adults for these limitations and how to manage them, and may serve to minimise or reduce the likelihood of some older adults going on to develop LO GAD.

12.1.5 Research Question 5: What is the Relationship between the Experience of Negative Life Events across the Lifespan and Symptoms of Anxiety, Worry and Depression in older adults with GAD?

The inclusion of a measure of negative life events in the present study allowed for the exploration of a number of relationships between the age at onset of GAD and the experience of negative life events across the lifespan that have not previously been addressed. The experience of negative life events at different developmental periods throughout life was explored so as to get a picture of the prevalence of negative life events experienced by the current sample of older adults with EO and LO GAD (Exploratory Research Question 1). All EO and LO participants reported the experience of at least one negative event during their life. Events involving the death of significant others, severe illness of oneself and others, emotional abuse and neglect, relational stress, and problem behaviours of significant others were all found to occur at high rates throughout life for the current sample of EO and LO participants.

Exploratory research question 2 aimed to understand the relationship between the experience of specific negative life events during each developmental period and symptoms of depression, anxiety and worry in later life amongst older adults with EO and LO GAD. The results revealed crime, disaster and/or war (CDW) events in childhood and severe illness of others in late-adulthood to be associated with low scores on self-report measures of pathology in late-life amongst EO participants. On the other hand, events involving negative socioeconomic circumstances and CDW events in late-adulthood were significantly associated with symptoms of trait anxiety in late-life. The current findings indicate that financial problems and/or instability and trauma-related events in late-adulthood are associated with the tendency to be anxious in late-life amongst those with EO GAD.

In contrast to findings for EO participants, significant associations between negative life events and symptoms of psychopathology were found across all four developmental periods for the LO group. These relationships were all positive, indicating that the experience of one or more negative life events was associated with high scores on self-report measures of psychopathology. Specifically, sexual abuse in childhood was associated with high scores on measures of trait anxiety and anxiety sensitivity in later life, whilst problem behaviours of significant others in childhood was also associated with high trait anxiety in later-life. A significant relationship between relational stress in adulthood and symptoms of depression in late-life was found for participants with LO GAD. CDW events experienced in adulthood were associated with high scores on a measure of pathological worry in late-life, whilst sexual abuse in adulthood was associated with poor emotional well-being in late-life, as reflected in high scores on measures of trait anxiety and anxiety sensitivity in later life.

Experiences of severe personal illness in late-adulthood and in the year prior to interview were significantly associated with symptoms of anxiety and depression. These findings suggest that events involving severe personal illness in late life, particularly in the twelve months prior to time of interview are significantly associated with poor psychological health in late-life amongst those with LO GAD. The experience of negative socio-economic circumstances in the three latter developmental periods was associated with high scores on one or more measure of psychopathology in late-life, also highlighting the negative impact of such experiences throughout life on the psychological well-being of participants with LO GAD. CDW events experienced in the year prior to interview were associated with high scores on a measure of anxiety sensitivity, whilst problem behaviours of significant others in the year prior to interview was associated with high scores on a measure of anxiety.

Overall, the findings of multiple significant relationships between negative life events in the latter developmental periods, during which time the majority of LO participants had their first onset of GAD, and symptoms of psychopathology in late-life amongst the LO group are in keeping with the findings of research question 4, that negative health-related events and negative financial circumstances are significantly more likely to precede the onset of LO GAD than EO GAD. These findings are also in line with the model put forward by Boyd et al. (2000) suggesting LO GAD is associated with greater levels of life stress than EO GAD.

Exploratory Research Question 3 aimed to explore the relationship between the total number of specific negative life events experienced throughout life and symptoms of psychopathology in late-life. Amongst EO participants, only the experience of negative socio-economic circumstances throughout life was found to be associated with high trait anxiety in late life. On the other hand, experiences of severe personal illness, negative socio-economic circumstances, sexual abuse, relational stress and the total number of negative life events experienced from all event clusters throughout life were all correlated with high scores one or more self-report measure of anxiety, worry and/or depression. In line with the findings of exploratory Research Question 2, investigation of the accumulation of specific life events throughout life also support the diathesis-stress model put forward to account for an age of onset distinction in late-life GAD, according to which the incidence of LO anxiety is associated with the accumulation of, and greater levels of life stress than EO anxiety.

Exploratory Research Question 4 examined the relationship between the total number of negative events occurring in each developmental period and symptoms of psychopathology in late-life. Amongst EO participants, no significant relationships were found between the total number of negative life events experienced in each of the four developmental periods and symptoms of psychopathology in late-life. For participants with LO of GAD, a significant relationship was found between the total number of negative life events experienced in childhood and trait anxiety in late-life, and with the total number of events experienced in adulthood and anxiety sensitivity in late-life. The findings of Research Questions 2-4 indicate that LO GAD is associated with greater levels of life stress than EO GAD, as proposed by the diathesis-stress model of early- and late- onset anxiety. It is important to note, however, that although both EO and LO participants experienced multiple negative events across the lifespan, the incidence of these events in specific developmental periods and throughout life was only associated with significant anxiety symptoms as per self-report measures amongst those with LO GAD. As such, whilst both groups experience numerous stressors throughout life, this stress may not be as significant to the onset of GAD in late-life for those with a greater emotional vulnerability to anxiety (EO) than those who are more psychologically resilient (LO), as suggested by the cognitive model put forward by Boyd et al. (2000).

Finally, the research reported in Chapter Ten examined whether older adults with EO and LO GAD differed with regard to the total number of specific negative life events experienced in each developmental period and throughout life (Exploratory Research Question 5), as well the total number of all events experienced in each developmental period and throughout life (Exploratory Research Question 6). The findings that EO participants experienced a significantly greater number of events involving emotional abuse in childhood, relational stress in adulthood, and problem behaviours of others in adulthood, the year prior to interview and throughout life, as well as a significantly greater number of total negative events in adulthood than those in the LO group (Research Question 5) are in line with previous research (Hoehn-Saric et al., 1993) reporting greater developmental difficulties and interpersonal adjustment for the EO group. These findings further lend support to the cognitive model proposing greater emotional vulnerability to psychopathology in those with EO GAD, as outlined in Chapter Four.

12.2 Study Two

12.2.1 What are the Implications of an Age at Onset Distinction for the treatment of Late-life GAD?

The present study is one of a few to examine the implications of an age at onset distinction in the treatment of GAD in late-life. The research provided considerable information regarding the nature of the relationship between age at onset of GAD and psychological wellbeing before, during and after a twelve-week CBT treatment program for older adults. In addition, the study provided valuable information regarding the contribution of the specific components of CBT to treatment outcome in late-life.

Levels of the primary outcome measures including anxiety, worry, depression, participant-rated GAD symptom severity, anxiety, coping and evaluations of the usefulness of treatment, as well as secondary outcome measures including trait anxiety, anxiety sensitivity, self efficacy and perceptions of anxiety control were examined over time to investigate i) the effect of time/ treatment on levels of the dependent variables; ii) the effect of age at onset on levels of the dependent variables; and iii) the interaction effect between treatment and age at onset on levels of the dependent variables. In

addition, the study aimed to investigate the maintenance of treatment gains at six-month follow-up.

Given the paucity of research into age at onset of late-life GAD and the variability in measures used across the research literature, it was not possible to compare baseline levels of anxiety and depression with other samples. The mean levels of worry and trait anxiety reported were however equivalent to those reported in other samples of early- and late-onset older adults undergoing treatment for GAD (Beck et al., 1996; Le Roux et al., 2005). The hypothesis that treatment would result in significant improvements in scores on primary and secondary outcome measures from pre- to post-treatment was supported by the current data, in line with previous research reporting the efficacy of CBT for GAD in older adults (Barrowclough, et al., 2001; Gorenstein, et al., 1999; King & Barrowclough, 1991; Mohlman, et al., 2003; Stanley, Beck, & Glassco, 1996; Stanley, Beck, et al., 2003; Wetherell, Gatz, et al., 2003).

Age of onset was not found to have a statistically significant effect on any of the primary or secondary outcome measures. These findings suggest that there is no difference in response to treatment between older adults with EO and LO GAD, in line with previous findings in the dysthymia literature (Barzega et al., 2001). These findings are promising in that participants with a lifetime history of GAD and those with a relatively shorter duration since illness onset both demonstrated a positive treatment outcome to a 12-week CBT program for GAD, which was maintained at six-month follow-up. The current findings have important clinical implications as they indicate that participants with EO and LO GAD both respond well to a manualised CBT program for GAD. These findings further suggest that the similarity of treatment received by both onset groups with respect to treatment focus and duration, rather than age of onset, may be the determinant of similar outcomes found for both onset groups, as previously suggested by Reynolds et al. (1998). Despite this outcome, participants who have experienced the disorder for many decades may feel understandably sceptical about their ability to benefit from the treatment, which may also contribute to the higher rates of benzodiazepine use found amongst those with EO GAD. Accordingly, both participants with EO and LO GAD may need ongoing education and encouragement about the treatment process and the benefits of CBT.

The current findings did not support the hypotheses that EO participants would respond better to CT techniques than those with LO GAD; and that LO participants would respond to BT techniques better than those with EO GAD. With the exception of a significant interaction effect for mean participant-rated GAD symptom severity, early- and late-onset participants were not found to differ in the rate of change on primary or secondary outcome measures over time. On average, LO participants reported significantly greater symptom severity at T1 than EO participants. Mean symptom severity was, however, similar for both onset groups from T2 onwards. Overall, the findings of the present study demonstrated that older adults with an onset of GAD early in life and those with a more recent history responded equally as favourably to all components of treatment. Although the biggest change on outcome measures followed completion of the cognitive skills component, relaxation and behavioural skills were nonetheless also rated as useful, suggesting that cognitive and behavioural therapy techniques are both necessary components in the treatment of GAD in late-life regardless of age at onset . The current findings highlight the fact that older adults with EO and LO GAD both respond well to an integrated CBT program and would suggest that a full package of CBT including all three components of CBT to target the core symptoms of GAD would be superior to specific treatment components delivered in isolation.

The current data revealed that improvements on primary and secondary outcome measures at the completion of treatment were maintained at six-month follow-up by both early- and late-onset participants. The present findings suggest that at least in the short-term, older adults with EO and LO GAD do not differ with regard to time to relapse and/or maintenance of treatment gains. Further longitudinal follow-up is required to examine this further.

The current findings point to fact that older adults are capable of engaging in, learning and benefitting from therapy, as reflected in the statement of one participant: "if only I had done this twenty years earlier." As such, these findings also indicate that there is a need for education about this amongst GPs and other service providers who may be reluctant to refer older adults, especially those with a long history of anxiety, for psychological services due to the belief that they may not respond well to this treatment. Regarding the role of psychologists then, there is a need for psychologists to have the appropriate training necessary to work with older adults and also a willingness to offer

services to older adults. The provision of psychological services to older adults may require greater flexibility in the implementation of the various components of CBT in terms of the order in which they are delivered and the amount of time and/or number of sessions spent on each component. Although the number of sessions in each treatment module delivered as part of CBT was limited according to the treatment manual, it may be that some participants would have benefitted from additional sessions focusing on cognitive therapy skills and some participants also expressed this. As such, an integrated CBT programme with the inclusion of aspects such as relaxation training that give the sense of immediate mastery in addition to an emphasis on or a greater number of sessions on cognitive strategies such as reformulation of inaccurate or maladaptive beliefs may be implemented in future treatment of GAD in late-life.

12.3 Limitations

Although the current study improved upon previous investigations by measuring lifetime rather than current psychiatric comorbidity, and examining differences in age at onset in a sample of adults with late-life anxiety using an empirically supported threshold to distinguish early and late-onset groups, there are several limitations that may affect the generalisabilty of the current findings. First, the study relates to a self-selected sample, whereby participants were individuals responding to an invitation to participate in research. As such, sampling bias inherent in self-referral studies such as this are possible, as individuals volunteering for such studies may differ from other psychiatric patients. Indeed, the current sample consisted of older adults with relatively good physical health, and it is possible that older adults with relatively good physical/medical health are more likely to self-refer to a treatment study, which may have further influenced the current findings. To this end, it would be beneficial for future investigations to consider non-treatment seeking individuals, including referrals made by general practitioners, psychiatrists, and other specialist services.

The fact that there appear to be a greater number of LO participants in studies one and two may be also be a product of sampling bias in that those with a more recent onset were more likely to be seeking treatment, whereas those with a long history or course of illness do not seek treatment. However, as seen in the descriptive analysis of treatment history, 75% of the EO sample had previously sought treatment of some kind, be it

medication or psychotherapy, versus 66.7% of the LO sample, and therefore does not account for the larger proportion of older adults with a LO disorder in the present study.

One potential limitation as highlighted by Van den Berg et al. (2001) is that in studies where psychiatric history (i.e., age of onset) is assessed retrospectively, recall bias may be an important confounding factor. According to Van den Berg and colleagues, errors in recall may lead to a significant underestimation of the true lifetime prevalence of psychiatric disorders, and that subjects have been found to be more likely to forget episodes than to 'gain' them. As such, it is possible that the group of participants with LO GAD may include participants that should be classified as EO cases. The lifetime version of the ADIS-IV has prompts for other events occurring at the time of the recalled episode (family, work and education, health and other events) which are more easily associated with dates than time of illness occurrence, and was therefore used in order to minimise this bias.

One consideration with regard to investigation of negative life events across the lifespan is that of the validity of retrospective recollections of life events by older subjects. According to Brown (1972) and Teasdale (1983) (cited in: Kraaij & de Wilde, 2001), there is evidence to suggest that depressed persons may report more negative life events than non-depressed persons in order to account for their current emotional state. It has also been suggested that older people may not remember early experiences accurately (Kraaij & de Wilde, 2001). However, in their review of retrospective reports Brewin, Andrews, & Gotlib (1993) concluded that there is little reason to link psychiatric status with reduced reliability or validity for recall of early experiences, and that much of our autobiographical recollection of the past is reasonably free from error, so long as we stick to remembering the broad outline of events and not detailed information. The present study focused on the broad outline of events only, and did not include questions regarding the details of an event. Another issue addressed by Kraaij and de Wilde (2001) is that memory for dates and the temporal order of events may be subject to error, and therefore the negative life events questionnaire did not date events precisely, but rather used four time periods within which to identify the occurrence of events.

Another limitation of the current investigation is the fact that participants were relatively homogeneous. Participants were mostly Caucasian, female, physically healthy and relatively well educated. Thus, the current findings may not generalise to older

GAD patients who are male, frail, have low education or socio-economic status, or are from other ethnic backgrounds. Moreover, the current sample consisted of community-dwelling older adults who were cognitively intact, further limiting the generalisabilty of the current finding to other populations. Previous investigations of an onset distinction in the depression literature indicate that there is some evidence for greater cognitive impairment in individuals with LO depression, though findings are inconsistent (Brodaty et al., 2001), and it is possible that cognitive functioning may further differentiate anxious older adults with EO of anxiety from those with first onset later in life. Future investigations should therefore consider older adults from varying socio-economic backgrounds, levels of cognitive functioning as well as those from in-patient settings.

One limitation of the treatment study (Study Two) was the smaller sample size of participants who took part (EO group = 18; LO group = 23). As such, whilst the main effect of treatment was strong enough to be significant, even with a small sample size, it is possible that differences between age of onset groups exist, but that the sample size did not allow the study to have enough power to detect age of onset differences or an interaction effect. Further research should involve a larger sample size as this will allow for the use of more sophisticated statistical analyses and increase the power to detect significant differences

As GAD symptom severity was clinician-rated at T0 and participant-rated from T1 through to T4, another limitation of the treatment study was the exclusion of ratings at T0 from the analysis of GAD symptom severity over time. It is therefore difficult to make conclusions about changes in symptom severity following the somatic control component of treatment, without a baseline measure. Future investigations should include both participant and clinician-rated symptom severity across all time-points to further understand the contribution of relaxation skills in the management of GAD and whether this differs according to subjective and objective ratings of symptom severity.

A further limitation of the investigation in Section Two was the variability associated with different group leaders. Whilst this did not appear to affect the attrition rate of participants it is unknown as to whether this affected treatment outcome. Therapist variables have previously been suggested to be important in predicting treatment outcome (Wetherell, 2000). Therapist competence was not assessed in the current study

and therefore it is not possible to make conclusions as to whether this contributed to any differences in treatment outcome amongst individuals.

Another weakness of this study was the fact that the order in which components of CBT was delivered was not counterbalanced across participants. As such, the improvements seen after the cognitive skills module and after treatment may have been due to the cumulative effects of CBT, rather than the cognitive skills component alone. Furthermore, the fact that treatment components were administered to participants in a standard format rather than being directly compared to one another may limit the conclusions made regarding the differential efficacy of specific CBT components for early- and late- onset groups. Although this was addressed in part by having participants rate the usefulness of each component at the end of each treatment module, it would be informative to analyse components of CBT separately in future research to further investigate hypotheses of differential efficacy of CBT in older adults distinguished by age at onset.

Finally, GAD was the most severe or disabling condition for the majority of participants in the present sample. As a result, despite the high rates of comorbidity between GAD and other disorders such as major depression or panic disorder, the generalisability of these results to individuals with principal diagnoses of disorders other than GAD may be limited. In addition, because the study was a cross-sectional design in which data were gathered at one time point, it is not possible to draw conclusions regarding the causal direction of associations.

Despite such limitations the results of the present study has several advantages compared to those previously conducted. These include the use of a semi-structured clinical interview administered by the investigator to assess lifetime episodes of psychiatric illness in addition to the current episode. In addition, the present study included the use of an independent rater to confirm diagnoses and age of onset with good reliability. The psychometric measures used also had good reliability and validity and the present study also made use of a manualised treatment protocol.

12.4 Conclusions and Recommendations for Future Research

Although anxiety symptoms in patients who develop GAD typically start at an early age, the current study confirms the clinical observation that anxiety symptoms can develop for the first time in later life and presents important information about the relationship between age at onset and late-life GAD. Overall, EO participants were found to differ from those with LO GAD with regard to benzodiazepine and health supplement use; history of anxiety since initial onset; number of discrete episodes of illness; family history suggesting a longstanding genetic vulnerability; psychiatric comorbidity (using cut-off of 50); percentage of time spent worrying, distress; and interviewer rated severity of GAD .On the other hand, LO GAD was found to be associated with- poorer perceived health, greater functional limitations, greater frequency and severity of both health-related stressful events and difficult financial circumstances, and with greater severity of events involving change in education and/or occupation prior to first onset of a DSM-IV anxiety disorder of any kind.

The current findings suggest that over the long term, EO GAD is poorly managed. These findings highlight the need for education amongst the medical community regarding the first line management of anxious presentations and indicate a role for psychologists in providing early intervention, including more education and support, for individuals identified with a family history of psychiatric illness and those presenting with functional limitations and poor perceptions of their health. Appropriate education and early intervention from medical professionals and psychologists may also better prepare older adults for limitations associated with negative health-related changes in later life and how to manage them, therefore minimising the likelihood of some older adults going on to develop LO GAD.

The current findings indicate that age at onset is not a factor as to treatment response and that both onset groups respond equally as well to manualised, individual CBT for GAD. Accordingly, it is important for both the medical profession and psychologists to recognize that anxiety causing impairment and/or interference to daily life should not be considered as part of 'normal' ageing and that older adults are able to benefit from CBT. This is significant considering the side effects that some older adults may experience with psychotropic medications, issues of poly-pharmacy and the reluctance

of many older adults to add yet another medication to often complicated medication regimes.

As outlined in the above section, it is recommended that future investigations of age at onset research use the statistical method outlined in this investigation for identifying a cut-off age that is specific to the sample in order to distinguish between an EO and LO sample. The present findings further suggest that future investigations of late-life GAD should examine the possibility of a tri-modal distribution of age at onset in a larger, more heterogenous sample of older adults. A considered, long-term investigation of age at onset in which individuals are followed from an early age would allow for a more in-depth examination of the model put forward by Boyd et al (2001), including an investigation of the role of vulnerability factors in EO GAD. With regard to the psychological treatment of GAD in late-life, both cognitive and behavioural interventions appear to be significant in bringing about therapeutic change and should be included in an integrated CBT programme for the treatment of late-life GAD for those older adults who are cognitively intact. It is recommended that future research compare cognitive and behavioural components of CBT with one another to determine whether the efficacy of CT and BT varies according to age of onset. Furthermore, future studies should conduct follow-up over a longer period of time, (i.e. at12 months, 2 years) to investigate the long-term maintenance of treatment gains and course of recovery further.

Age at onset of GAD appears to be a factor in the long-term management of GAD. With the assistance of further research, a greater understanding of the nature and influence of age at onset on the presentation and treatment of late-life GAD may inform the possibilities for improving the psychological well being of individuals, particularly in late-life. The ability to intervene and improve the psychological well-being of older adults, in particular given the complex medical comorbidities that many older adults often face with advancing age could have significant social, economic and health-related benefits for Australia's aging population.

REFERENCES

Abrams, R. C., Alexopoulos, G. S., & Young, R. C. (1987). Geriatric depression and DSM-III—R personality disorder criteria. *Journal of the American Geriatrics Society, 35*(5), 383-386.

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hoplessness depression: A theory-based sub-type of depression. *Psychological Review, 96*, 358-372.

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*(1), 49-74.

AIHW. (2003). *Mental Health Services in Australia 2003-04*. Canberra: Australian Institute of Health and Welfare.

AIHW. (2007). *Older Australians at a glance: 4th Edition*. Canberra: Australian Institute of Health and Welfare.

Alexopoulos, G. S. (1991). Anxiety and depression in the elderly. In C. Salzman & B. Lebowitz (Eds.), *Anxiety in the Elderly: Treatment and Research* (pp. 63-74). New York: Springer Publishing Company.

Alexopoulos, G. S., Meyers, B. S., Young, R. C., Kakuma, T., Feder, M., Einhorn, A., et al. (1996). Recovery in geriatric depression. *Archives of General Psychiatry, 53*(4), 305-312.

Allgulander, C., & Lavoria, P. W. (1993). Causes of death among 936 elderly patients with 'pure' anxiety neurosis in Stockholm County, Sweden, and in patients with depressive neurosis or both diagnoses. *Comprehensive Psychiatry, 34*(5), 299-302

American Psychiatric Association. (1987). *Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition - Revised* (3rd ed.). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition.* (4th ed.). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition - Text Revision*. Washington, DC: American Psychiatric Association.

Angst, J. (1996). Comorbidity of mood disorders: a longitudinal perspective study. *British Journal of Psychiatry, 30*, 31-37.

Antony, M. M., & Barlow, D. H. (2002). *Handbook of Assessment and Treatment Planning for Psychological Disorders*. New York: Guilford Press.

APA. (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.). Washington, DC: American Psychiatric Association.

Arbuckle, T. Y., Pushkar, D., Chaikelson, J., & Andres, D. (1999). Coping and control processes: Do they contribute to individual differences in health in older adults? *Canadian Journal of Aging, 18*, 285-312.

Astrom, M. (1996). Generalized anxiety disorder in stroke patients. A 3-year longitudinal study. *Stroke, 27*, 270-275.

Australian Bureau of Statistics. (1997). *Australian Standard Classification of Occupations on CDROM*. Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics. (2006). *National Health Survey: Summary of results 2004-05*.

Ayers, C. R. (2005). *Cognitive content and vulnerabilities to anxiety in later life.*, George Mason University.

Ayers, C. R., Sorrell, J. T., Thorp, S. R., & Wetherell, J. L. (2007). Evidence-based psychological treatments for late-life anxiety. *Psychology and Aging, 22*(1), 8-17.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Baldwin, R. C., Benbow, S. M., Marriott, A., & Tomenson, B. (1993). Depression in old-age - A reconsideration of cerebral disease in relation to outcome. *British Journal of Psychiatry, 163*, 82-90.

Baldwin, R. C., & Tomenson, B. (1995). Depression in later life: A comparison of symptoms and risk factors in early and late onset cases. *British Journal of Psychiatry, 167*, 649-652.

Barlow, D. H. (1988). *Anxiety and its disorders: The nature and treatment of anxiety and panic*. New York: Guilford Press.

Barlow, D. H. (2002). *Anxiety and its Disorders: The Nature and Treatment of Anxiety and Panic*. New York: Guilford Press.

Barlow, D. H., & Campbell, L. A. (2000). Mixed anxiety-depression and its implications for models of mood and anxiety disorders. *Comprehensive Psychiatry, 41*(2, Supplement 1), 55-60.

Barlow, D. H., Rapee, R. M., & Brown, T. A. (1992). Behavioral treatment of generalized anxiety disorder. *Behavior Therapy, 23*, 551-570.

Barrowclough, C., King, P., Colville, J., Russell, E., Burns, A., & Tarrier. (2001). A randomized trial of the effectiveness of cognitive-behavioural therapy and supportive counseling for anxiety symptoms in older adults. *Journal of Consulting and Clinical Psychology, 69*(5), 756-762.

Barzega, G., Maina, G., Venturello, S., & Bogetto, F. (2001). Dysthymic disorder: clinical characteristics in relation to age at onset. *Journal of Affective Disorders, 66*, 39-46.

Battaglia, M., Bertella, S., Bajo, S., Politi, E., & Bellodi, L. (1998). An investigation of the co-occurrence of panic and somatization disorders through temperamental variables. *Psychosomatic Medicine, 60*(6), 726-729.

Battaglia, M., Bertella, S., Politi, E., Bernardeschi, L., Perna, G., Gabriele, A., et al. (1995). Age at onset of panic disorder: influence of familial liability to the disease and of childhood separation anxiety disorder. *American Journal of Psychiatry, 152*, 1362-1364.

Beck, A. T. (1987). Cognitive Models of depression. *Journal of Cognitive Psychotherapy, 1*, 2-27.

Beck, A. T., Epstein, N., Brown, G. K., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893-897.

Beck, A. T., & Steer, R. A. (1993). *Manual for the Beck Anxiety Inventory*. San Antonio, TX: The Psychological Corporation.

Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories-IA and-II in psychiatric outpatients. *Journal of Personality Assessment, 67*(3), 588-597.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561-571.

Beck, J. G., & Stanley, M. A. (1997). Anxiety disorders in the elderly: The emerging role of behavior therapy. *Behavior Therapy, 28*, 83 - 100.

Beck, J. G., Stanley, M. A., & Zebb, B. J. (1995). Psychometric properties of the Penn State Worry Questionnaire in older adults. *Journal of Clinical Gerontology, 1*(1), 33-42.

Beck, J. G., Stanley, M. A., & Zebb, B. J. (1996). Characteristics of generalized anxiety disorder in older adults: A descriptive study. *Behaviour Research and Therapy, 34*(3), 225-234.

Beekman, A. T. F., Bremmer, M. A., Deeg, D. J. H., van Balkom, A. J. L. M., & Smit, J. H. (1998). Anxiety disorders in later life: a report from the longitudinal aging study in Amsterdam. *International Journal of Geriatric Psychiatry, 13*, 717-726.

Beekman, A. T. F., de Beurs, E., van Balkom, A. J. L. M., Deeg, D. J. H., van Dyck, R., & van Tilburg, W. (2000). Anxiety and Depression in Later Life: Co-occurrence and communality of risk factors. *American Journal of Psychiatry, 157*(1), 89-95.

Beekman, A. T. F., Deeg, D., Van Tilburg, T., Smit, J. H., Hooijer, C., & van Tilburg, W. (1995). Major and Minor depression in later life: A study of prevalence and risk factors. *Journal of Affective Disorders, 36*, 65-75.

Behar, E., Aclaine, O., Zuellig, A. R., & , & Borkovec, T. D. (2003). Screening for generalized anxiety disorder using the Penn State Worry Questionnaire: a receiver operating characteristic analysis. *Journal of Behavior Therapy and Experimental Psychiatry, 34*, 25-43.

Beidel, D. C., & Turner, S. M. (1997). At risk for anxiety: Psychopathology in the offspring of anxious parents. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*(7), 918-924.

Beitchman, J. H., Zucker, K. J., Hood, J. E., Dacosta, G. A., Ackman, D., & Cassavia, E. (1992). A review of the long-term effects of child sexual abuse. *Child Abuse and Neglect, 16*, 101-118.

Benazzi, F. (2001). Early-onset versus Late-onset Bipolar II chronic depression. *Depression and Anxiety, 13*, 45-49.

Bifulco, A., Harris, T., & Brown, G. W. (1992). Mourning or early inadequate care? Reexamining the relationship of maternal loss in childhood with adult depression and anxiety. *Development and Psychopathology., 4*, 433-449.

Bland, R. C., Newman, S. C., & Orn, H. (1988). Prevalence of psychiatric disorders in the elderly in Edmonton. *Acta Psychiatrica Scandinavica, 338*, 57-63.

Blazer, D. G., George, L. K., & Hughes, D. C. (1991). The epidemiology of anxiety disorders: An age comparison. In C. Salzman & B. D. Lebowitz (Eds.), *Anxiety in the elderly*. New York: Springer.

Blazer, D. G., Hughes, D. C., & George, L. K. (1987). Stressful life events and the onset of generalized anxiety disorder syndrome. *American Journal of Psychiatry, 144*, 1178-1183.

Blazer, D. G., Hughes, D. C., & George, L. K. (1991). Generalized anxiety disorder. In L. N. Robins & D. A. Regier (Eds.), *Psychiatric disorders in America: The epidemiological Catchment Area Study* (pp. 180-203). New York: Free Press.

Boyd, J., McKiernan, F., & Waller, G. (2000). Early-onset and late-onset depression in older adults: psychological perspectives. *Reviews in Clinical Gerontology, 10*, 149-159.

Brandstadter, J., & Renner, G. (1990). Tenacious goal pursuit and flexible goal adjustment: Explication and age related analysis of assimilative and accommodative strategies of coping. *Psychology and Aging, 5*, 58-67.

Brandstadter, J., Rothermund, K., & Schmitz, U. (1997). Coping resources in later life. *European Review of Applied Psychology, 47*, 107-114.

Brenes, G. A., Guralnik, J. M., Williamson, J. D., Fried, L. P., Simpson, C., Simonsick, E. M., et al. (2005). The influence of anxiety on the progression of disability. *Journal of the American Geriatrics Society, 53*(1), 34-29.

Brewin, C. R., Andrews, B., & Gotlib, I. H. (1993). Psychopathology and early experience: a reappriasal of retrospective reports. *Psychological Bulletin, 113*, 82-98.

Brodaty, H., Harris, L., Peters, K., Wilhelm, K., Hickie, I., Boyce, P., et al. (1993). Prognosis of depression in the elderly: A comparison with younger patients. *The British Journal of Psychiatry, 163*, 589-596.

Brodaty, H., Luscombe, G., Parker, G., Wilhelm, K., Hickie, I., Austin, M., et al. (2001). Early and late onset depression in old age: different aetiologies, same phenomenology. *Journal of Affective Disorders, 66*, 225-236.

Brodaty, H., Peters, K., Boyce, P., Hickie, I., Parker, G., Mitchell, P., et al. (1991). Age and Depression. *Journal of Affective Disorders, 23*(3), 137-149.

Brown, G. W., & Harris, T. O. (1993). Aetiology of anxiety and depressive disorders in an inner-city population. 1 . Early adversity. *Psychological Medicine, 23*, 143-154.

Brown, T. A., Antony, M. M., & Barlow, D. H. (1995). Diagnostic comorbidity in panic disorder: effect on treatment outcome and course of comorbid diagnoses following treatment. *Journal of Consulting & Clinical Psychology, 63*, 408-418.

Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample. *Journal of Abnormal Psychology, 110*(4), 585-599.

Brown, T. A., Di Nardo, P. A., & Barlow, D. H. (2004). *Anxiety Disorders Interview Schedule Lifetime Version: For DSM-IV, Client Interview Schedules*. New York: Graywind Publications.

Bryant, C., Jackson, H., & Ames, D. (2008). The prevalence of anxiety in older adults: Methodological issues and a review of the literature. *Journal of Affective Disorders, 109*, 233-250.

Burke, K. C., Burke, J. D., Regier, D. A., & Rae, D. S. (1990). Age at onset of selected mental disorders in five community populations. *Archives of General Psychiatry, 47*, 511-518.

Butler, G., Fennell, M., Robson, P., &, & Gelder, M. (1991). Comparison of behavior therapy and cognitive behavior therapy in the treatment of Generalized Anxiety Disorder. *Journal of Consulting and Clinical Psychology, 59*(1), 167-175.

Byrne, G. J. A. (2002). What happens to anxiety disorders in later life? *Revista Brasileira de Psiquiatria, 24*(1), 74-80.

Carmin, C. N., Wiegartz, P. S., & Scher, C. (2000). Anxiety disorders in the elderly. *Current Psychiatry, 2*(1), 13-19.

Cattell, R. B. (1966). The scree test for number of factors. *Multivariate Behavioral Research, 1*, 245-276.

Chambless, D. L., Caputo, G. C., Bright, P., & Gallagher, R. (1984). Assessment of fear of fear in agoraphobics: The Body Sensations Questionnaire and the Agoraphobic Cognitions Questionnaire. *Journal of Consulting and Clinical Psychology, 52*(6), 1090-1097.

Chipperfield, J. G. (1993). Incongruence between health perceptions and health problems: Implications for survival among seniors. *Journal of Aging and Health, 5*(4), 475-496.

Chipperfield, J. G., Campbell, D. W., & , & Perry, R. P. (2004). Stability in perceived control. *Journal of Aging and Health, 16*(1), 116-147.

Chou, K. L. (2009). Age at onset of generalized anxiety disorder in older adults. *American Journal of Geriatric Psychiatry, 17*(6), 455-464.

Clark, L. A., & Watson, D. (1991). A tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*, 316-336.

Clemence, A., Karmaniola, A., Green, E. G. T., & Spini, D. (2007). Disturbing life events and wellbeing after 80 years of age: a longitudinal comparison of survivors and the deaceased over five years. *Ageing and Society, 27*, 195-213.

Coolidge, F. L., Segal, D. L., Hook, J. N., &, & Stewart, S. (2000). Personality disorders and coping among anxious older adults. *Journal of Anxiety Disorders, 14*(2), 157-172.

Copeland, J. R., Davidson, I. A., & Dewey, M. E. (1987). The prevalence and outcome of anxious depression in elderly people aged 65 and over living in the community. In G. Racagni & E. Smeraldi (Eds.), *Anxious Depression: Assessment and Treatment* (pp. 43-47). New York: Raven Press.

Copeland, J. R., Dewey, M. E., Wood, N., Searle, R., Davidson, I. A., & McWilliam, C. (1987). Range of mental illness among the elderly in the community. Prevalence in Liverpool using the GMS-AGECAT package. *The British Journal of Psychiatry, 150*, 815-823.

Copeland, J. R., Gurland, B. J., Dewey, M. E., Kelleher, M. J., Smith, A. M. R., & Davidson, I. A. (1987). The distribution of dementia, depression and neurosis in elderly men and women in an urban community: Assessed using the GMS–AGECAT package. *International Journal of Geriatric Psychiatry, 2*(3), 177-184.

Costello, C. G. (1982). Social factors associated with depression: A retrospective community study. *Psychological Medicine, 12*(2), 329-330.

Craske, M. G., Barlow, D. H., & O'Leary, T. A. (1992). *Mastery of your Anxiety and Worry*. San Antonio: Harcourt Brace.

Crowe, R. R., Noyes, R., Pauls, D. L., & Slymen, D. (1983). A family study of panic disorder. *Archives of General Psychiatry, 40*(10), 1065-1069.

Cumming, E., & Henry, W. (1961). *Growing Old: The Process of Disengagement*. New York: Basic Books.

Davies, A. D. M. (1996). Life events, health, adaptation and social support in the clinical psychology of late life. In R. T. Woods (Ed.), *Handbook of the clinical psychology of ageing* (pp. 115-140). Chichester: John Wiley.

de Beurs, E., Beekman, A. T. F., Deeg, D. J. H., van Dyck, R., & van Tilburg, W. (2000). Predictors of change in anxiety symptoms of older persons: results from the Longitudinal Aging Study Amsterdam. *Psychological Medicine, 30*, 515-527.

de Beurs, E., Beekman, A. T. F., Geerlings, S., Deeg, D., van Dyck, R., & van Tilburg, W. (2001). On becoming depressed or anxious in late life: similar vulnerability factors but different effects of stressful life events. *British Journal of Psychiatry, 179*, 426-431.

de Beurs, E., Beekman, A. T. F., Van Balkom, A. J. L., Deeg, D. J. H., van Dyck, R., & van Tilburg, W. (1999). Consequences of anxiety in older persons: its effect on

disability, well-being, and use of health services. *Psychological Medicine, 29*, 583-593.

de Beurs, E., van Balkom, A., Van Dyck, R., & Lange, A. (1999). Long-term outcome of pharmacological and psychological treatment for panic disorder with agoraphobia: a 2-year naturalistic follow-up. *Acta Psychiatrica Scandinavica, 99*(1), 59-67.

Deeg, D. J. H., Knipscheer, C. P. M., & van Tilburg, W. (1993). *Autonomy and Well-being in the Aging Population: Concepts and Design of the Longitudinal Aging Study Amsterdam*. Bunnik: Netherlands Institute of Gerontology.

Devanand, D. P., Adorno, E., Cheng, J., Burt, T., Pelton, G. H., Roose, S. P., et al. (2004). Late onset dysthymic disorder and major depression differ from early onset dysthymic disorder and major depression in elderly outpatients. *Journal of Affective Disorders, 78*, 259-267.

Dew, M. A., Reynolds, C. F., Houck, P. R., Hall, M. H., Buysse, D. J., Frank, E., et al. (1997). Temporal profiles of the course of depression during treatment: predictors of pathways toward recovery in the elderly. *Archives of General Psychiatry, 54*, 1016-1024.

Di Nardo, P. A., Brown, T. A., & Barlow, D. H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV*. San Antonio, TX: The Psychological Corporation, Harcourt Brace.

Diefenbach, G. J., Stanley, M. A., & Beck, J. G. (2001). Worry content reported by older adults with and without generalised anxiety disorder. *Aging & Mental Health, 5*(3), 269-274.

DiNardo, P. A., Brown, T. A., & Barlow, D. H. (1994). *Anxiety disorders interview schedule for DSM-IV: Lifetime version (ADIS-IV-L)*. Albany, NY: Graywind Publications.

Driscoll, H. C., Basinski, J., Mulsant, B. H., Butters, M. A., Dew, M. A., Houck, P. R., et al. (2005). Late-onset major depression: clinical and treatment-response variability. *International Journal of Geriatric Psychiatry, 20*(7), 661-667.

Eaton, W. W., Kramer, M., Anthony, J. C., Dryman, A., Shapiro, S., & Locke, B. Z. (1989). The incidence of specific DIS/DSM-III mental disorders: data from the NIMH Epidemiologic Catchment Area Program. *Acta Psychiatrica Scandinavica, 79*(2), 163-178.

Erickson, E. (1950). *Childhood and society*. London: Norton.

Erickson, E. (1980). *Identity and the life cycle*. London: Norton.

Erickson, E. (1997). *The life cycle completed: extended version*. London: Norton.

Erickson, E., Erickson, J., & Kivnick, H. (1986). *Vital involvement in old age*. London: Norton.

Eysenck, H. J., & Eysenck, S. E. G. (1975). *Manual: Eysenck Personality Inventory*. San Diego: Educational and Industrial Testing Service.

Faravelli, C. (1985). Life events preceding the onset of panic disorder. *Journal of Affective Disorders, 9*, 103-105.

Faravelli, C., & Pallanti, S. (1989). Recent life events and panic disorder. *American Journal of Psychiatry, 146*, 622-627.

Finlay-Jones, R., & Brown, G. W. (1981). Types of stressful life events and the onset of anxiety and depressive disorders. *Psychological Medicine, 11*, 803-815.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. (1995). The Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II). Part I: Description. *Journal of Personality Disorders, 9*(2), 83-91.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. (1997). *Structured Clinical Interview for DSM-IV Axis 1 Disorders--Non-patient edition (version 2.0)*. New York: New York State Psychiatric Institute, Biometrics Research Department.

Flint, A. J. (1994). Epidemiology and comorbidity of Anxiety disorders in the elderly. *American Journal of Geriatric Psychiatry, 151*, 640-649.

Flint, A. J. (1997). Epidemiology and comorbidity of anxiety disorders in later life: Implications for treatment. *Clinical Neuroscience, 4*, 31 - 36.

Flint, A. J. (1999). Anxiety disorders in late life. *Canadian Family Physician, 45*, 2672-2679.

Flint, A. J. (2005a). Anxiety and its disorders in late life - Moving the field forward. *American Journal of Geriatric Psychiatry, 13*(1), 3-6.

Flint, A. J. (2005b). Generalised anxiety disorder in elderly patients - Epidemiology, diagnosis and treatment options. *Drugs & Aging, 22*(2), 101-114.

Flint, A. J., & Rifat, S. L. (1997a). The effect of treatment on the two-year course of late-life depression. *British Journal of Psychiatry, 170*, 268-272.

Flint, A. J., & Rifat, S. L. (1997b). Two-year outcome of elderly patients with anxious depression. *Psychiatry Research, 66*, 23 - 31.

Forsell, Y. (2000). Predictors for depression, anxiety and psychotic symptoms in a very elderly population: Data from a 3-year follow-up study. *Social Psychiatry and Psychiatric Epidemiology, 35*, 259-263.

Forsell, Y., & Winblad, B. (1998). Feelings of anxiety and associated variables in a very elderly population. *International Journal of Geriatric Psychiatry, 13*, 454-458.

Frances, A., & Flaherty, J. A. (1989). Elderly widow develops panic attacks, followed by depression. *Hospital and Community Psychiatry, 40*, 19-23.

Friedman, B., Heisel, M. J., & Delavan, R. L. (2005). Psychometric Properties of the 15-Item Geriatric Depression Scale in Functionally Impaired, Cognitively Intact, Community-Dwelling Elderly Primary Care Patients. *Journal of the American Geriatrics Society, 53*(9), 1570-1576.

Fuentes, K., & Cox, B. (2000). Assessment of anxiety in older adults: a community-based survey and comparison with younger adults. *Behaviour Research and Therapy, 38*, 297-309.

Ganzini, L., McFarland, B. H., & Cutler, D. (1990). Prevalence of mental disorders after catastrophic financial loss. *The Journal of Nervous and Mental Disease, 178*, 680-685.

Gladstone, G., & Parker, G. (2003). What's the use of worrying? Its function and its dysfunction. *Australian and New Zealand Journal of Psychiatry, 37*, 347 - 354.

Goldstein, R. B., Wickramaratne, P. J., Horwarth, E., & Weissman, M. M. (1997). Familial aggregation and phenomenology of early-onset panic disorder. *Archives of General Psychiatry, 54*, 271-278.

Gollan, J., Raffety, B., Gortner, E., & Dobson, K. (2005). Course profiles of early- and adult-onset depression. *Journal of Affective Disorders, 86*(1), 81-86.

Gorenstein, E. E., Kleber, M. S., Mohlman, J., Dejesus, M., Gorman, J. M., & Papp, L. A. (2005). Cognitive-behavioral therapy for management of anxiety and medication taper in older adults. *The American Journal of Geriatric Psychiatry, 13*(10), 901.

Gorenstein, E. E., Papp, L. A., Kleber, M., & Marc, S. (1999). Cognitive behavioral treatment of anxiety in later life. *Cognitive and Behavioral Practice, 6*(4), 305 - 320.

Greenberger, D., & Padesky, C. A. (1995). *Mind Over Mood: A Cognitive Therapy Treatment Manual For Clients*. New York: Guilford Press.

Grembowski, D., Patrick, D., Diehr, P., Durham, M., Beresford, S., Kay, E., et al. (1993). Self-efficacy and health behaviour change among older adults. *Journal of Health and Social Behavior, 34,* 89-104.

Grisham, J. R., Brown, T. A., & Campbell, L. A. (2004). The anxiety disorders interview schedule for DSM-IV (ADIS-IV). In M. Hersen (Ed.), *Comprehensive*

Handbook of Psychological Assessment: Personality Assessment (Vol. 2, pp. 163-178). New Jersey: John Wiley & Sons.

Hamilton, M. (1959). The assessment of anxiety states by rating. *British Journal of Medical Psychology, 32*, 50-55.

Hamilton, M. (1960). A rating scale for depression. *The Journal of Neurology, Neurosurgery, and Psychiatry, 23*(1), 56–62.

Hassan, R., & Pollard, C. A. (1990). Late-life onset panic disorder. *American Journal of Psychiatry, 147*, 1103-1104.

Hassan, R., & Pollard, C. A. (1994). Late-life onset panic disorder: clinical and demographic characteristics of a patient sample. *Journal of Geriatric Psychiatry and neurology, 7*, 84-88.

Havighurst, R. J. (1963). Successful aging. In R. Williams, C. Tibbitts & W. Donahue (Eds.), *Processes of Aging* (pp. 299–320). New York: Atherton Press.

Hettema, J. M., Kuhn, J. W., Prescott, C. A., & Kendler, K. S. (2006). The impact of generalized anxiety disorder and stressful life events on risk for major depressive episodes. *Psychological Medicine, 36*, 789-795.

Hickey, T., & Stilwell, D. (1992). Chronic illness and aging: a personal contextual model of age-related changes in health status. *Education Gerontology, 18*, 1-15.

Hocking, L. B., & Koenig, H. G. (1995). . *International Journal of Psychiatry in Medicine, 25*(3), 221 -238.

Hoehn-Saric, R., Hazlett, R., & McLeod, D. R. (1993). Generalized anxiety disorder with early and late onset of anxiety symptoms. *Comprehensive Psychiatry, 34*(5), 291-298.

Hoehn-Saric, R., & McLeod, D. R. (1985). Locus of control in chronic anxiety disorders. *Acta Psychiatrica Scandinavica, 72*(6), 529-535.

Holahan, C. K., Holahan, C. J., & Belk, S. S. (1984). Adjustment in aging: The roles of life stress, hassles, and self-efficacy. *Health Psychology, 3*(4), 315-328.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research, 11*, 213-218.

Holroyd, S., & Duryee, J. (1997). Differences in geriatric psychiatry outpatients with early- vs late-onset depression. *International Journal of Geriatric Psychiatry, 12*, 1100-1106.

Holwerda, T. J., Schoevers, R. A., Dekker, J., Deeg, D. J. H., Jonker, C., & Beekman, A. T. F. (2007). The relationship between generalized anxoety disorder,

depression, and mortality in old age. *Intenational Journal of Geriatric Psychiatry, 22*, 241-249.

Howard, R., Rabins, P. V., Seeman, M. V., Jeste, D. V., & Group., I. L.-O. S. (2000). Late-onset schizophrenia and very-late-onset schizophrenia-like psychosis: an international consensus. *American Journal of Psychiatry, 157*, 172-178.

Hughes, D. C., George, L. K., & Blazer, D. G. (1988). Age differences in life event qualities: Multivariate controlled analysis. *The International Journal of Aging and Human Development, 27*(3), 207 - 220.

Hunt, C., Issakidis, C., & Andrews, G. (2002). DSM-IV generalized anxiety disorder in the Australian National Survey of Mental Health and Well-Being. *Psychological Medicine, 32*, 649-659.

Hunt, S., Wisocki, P., & Yanko, J. (2003). Worry and use of coping strategies among older and younger adults. *Journal of Anxiety Disorders, 17*, 547 - 560.

Idler, E. L., & Kasl, S. (1991). Health perceptions and survival: Do global evaluations of health status really predict mortality? *Journal of Gerontology, 46*(2), S55-S65.

Iketani, T., Kiriike, N., Stein, M. B., Nagao, K., Minamikawa, N., Shidao, A., et al. (2004). Patterns of Axis II comorbidity in early-onset versus late-onset panic disorder in Japan. *Comprehensive Psychiatry, 45*(2), 114-120.

Jeste, N. D., Hays, J. C., & Steffens, D. C. (2006). Clinical correlates of anxious depression among elderly patients with depression. *Journal of Affective Disorders, 90*(1), 37-41.

Johnson, J. H., & Sarason, I. G. (1979). Moderator variables in life stress research. In G. Sarason & C. D. Spielberger (Eds.), *Stress and Anxiety* (Vol. 6, pp. 151-168). Washington, D.C.: Hemisphere.

Kalayam, B., & Alexopoulos, G. S. (1999). Prefrontal dysfunction and treatment response in geriatric depression. *Archives of General Psychiatry, 56*(8), 713-718.

Katerndahl, D. A., & Talamantes, M. (2000). A comparison of persons with early- versus late-onset panic attacks. *Journal of Clinical Psychiatry, 61*(6), 422-427.

Katon, W., & Roy-Byrne, P. P. (1991). Mixed anxiety and depression. *Journal of Abnormal Psychology, 100*, 337-345.

Keller, M. B. (2002). The long-term clinical course of generalized anxiety disorder. *Journal of Clinical Psychiatry, 63*(8), 11-16.

Kendler, K. S., Hettema, J. M., Butera, F., Gardner, C. O., & Prescott, C. A. (2003). Life event dimensions of loss, humiliation, entrapment, and danger in the prediction of onsets of Major Depression and Generalized Anxiety. *Archives of General Psychiatry, 60*(8), 789-796.

Kendler, K. S., Myers, J., & Prescott, C. A. (2002). The etiology of phobias: an evaluation of the stress-diathesis model. *Archives of General Psychiatry, 59*, 242-248.

Kennedy, B., & Schwab, J. (1997). Utilisation of medical specialists by anxiety disorder patients. *Psychosomatics, 38*, 109-112.

Kerkhof, A. J. F. M., Schmidke, A., Bille-Brahe, U., De Leo, D., & Lonnqvist, J. (1994). Attempted suicide in Europe. Findings from the WHO multicentre study on parasuicide by the WHO regional office for Europe. Leiden: DSWO Press.

Kessler, R. C., Keller, M. B., & Wittchen, H. (2001). The epidemiology of generalized anxiety disorder. *The Psychiatric Clinics of North America, 24*(1), 19-39.

Kessler, R. C., McGonagle, K. A., Zhao, S. Y., Nelson, C. B., Hughes, M., Eshleman, S., et al. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United Staes: results from the National Comorbidity Survey. *Archives of General Psychiatry, 51*, 8-19.

Kessler, R. C., Nelson, C. B., McGonagle, K. A., Lie, J., Swartz, M., & Blazer, D. G. (1996). Comorbidity of DSM-III-R major depressive disorder in the general population: Results form the US National Comorbidity Survey. *British Journal of Psychiatry, 168*, 17-30.

King, P., & Barrowclough, C. (1991). A clinical pilot study of cognitive–behavioural therapy for anxiety disorders in the elderly. *Behavioural Psychotherapy, 19*(4), 337-345.

Klein, D. N., Schatzberg, A. F., McCullough, J. P., Dowling, F., Goodman, D., Howland, R. H., et al. (1999). Age of onset in chronic major depression: relation to demographic and clinical variables, family history, and treatment response. *Journal of Affective Disorders, 55*, 149-157.

Koder, D. A., & , & Ferguson, S. J. (1998). The status of geropsychology in Australia: Exploring why Australian psychologists are not working with elderly clients. *Australian Psychologist, 33*(2), 96 - 100.

Kovacs, M., Gastonis, C., Paulauskas, S. L., & Richards, C. (1989). Depressive disorders in childhood IV. A longitudinal study of comorbidity and risk factors for anxiety disorders. *Archives of General Psychiatry, 46*, 776-782.

Kraaij, V., Arensman, E., & Spinhoven, P. H. (2002). Negative life events and depression in the elderly: a meta-analysis. *Journal of Gerontolgy: Psychological sciences, in press.*

Kraaij, V., & de Wilde, E. J. (2001). Negative life events and depressive symptoms in the elderly: a lifespan perspective. *Aging & Mental Health, 5*, 84-91.

Kraaij, V., Kremers, I., & Arensman, E. (1997). The relationship between stressful and traumatic life events and depression in the elderly. *Crisis, 18*, 86-88.

Krasucki, C., Howard, R., & Mann, A. (1998). The relationship between anxiety disorders and age. *International Journal of Geriatric Psychiatry, 13*, 79-99.

Krasucki, C., Howard, R., & Mann, A. (1999). Anxiety in the elderly: Anxiety and its treatment in the elderly. *International Psychogeriatrics, 11*(1), 25-45.

Krause, N., & Shaw, B. A. (2000). Role-specific feelings of control and mortality. *Psychology and Aging, 15*(4), 617-626.

Krishnan, K., Hays, J., Tupler, L., George, L., & Blazer, D. (1995). Clinical and phenomenological comparisons of late-onset and early-onset depression. *The American Journal of Psychiatry, 152*(5), 785-788.

Kurlowicz, L., & Greenberg, S. A. (2007). The Geriatric Depression Scale (GDS). *American Journal of Nursing, 107*(10), 67–68.

Kvaal, K., Macijauskiene, J., Engedal, K., &, & Laake, K. (2001). High prevalence of anxiety symptoms in hospitalized geriatric patients. *International Journal of Geriatric Psychiatry, 16*, 690 - 693.

Labouvie-Vief, G., DeVoe, M. R., & Bulka, D. (1989). Speaking about feelings: Conceptions of emotion across the life span. *Psychology and Aging, 4*, 425-437.

Lauderdale, S. A., & Sheikh, J. I. (2003). Anxiety disorders in older adults. *Clinics in Geriatric Medicine, 19*, 721-741.

Le Roux, H., Gatz, M., & Wetherell, J. L. (2005). Age at onset of Generalized Anxiety Disorder in Older Adults. *The American Journal of Geriatric Psychiatry, 13*(1), 23-30.

Lefcourt, H. M. (1980). Personality and locus of control. In J.Garber & M. E. P. Seligman (Eds.), *Human Helplessness: Theory and Applications* (pp. 245-259). New York: Academic Press.

Leger, J. M., Moulias, R., Vellas, B., Monfort, J. C., Chapuy, P., Robert, P., et al. (2000). Causes and consequences of elderly's agitated and aggressive behavior (English translation). *Encephale, 26*(1), 32-43.

Lenze, E. J., Mulsant, B. H., Mohlman, J., Shear, M. K., Dew, M. A., Schulz, R., et al. (2005). Generalized Anxiety Disorder in late life. Lifetime course and comorbidity with Major Depressive Disorder. *The American Journal of Geriatric Psychiatry, 13*(1), 77-80.

Lenze, E. J., Mulsant, B. H., Shear, M. K., Alexopoulos, G. S., Frank, E., & Reynolds, C. F. (2001). Comorbidity of depression and anxiety disorders in later life. *Depression and Anxiety, 14*, 86-93.

Lenze, E. J., Mulsant, B. H., Shear, M. K., Schulberg, H. C., Dew, M. A., Begley, A. E., et al. (2000). Comorbid anxiety disorders in depressed elderly patients. *American Journal of Psychiatry, 157*(5), 722-728.

Lenze, E. J., Rogers, J. C., Martire, L. M., Mulsant, B. H., Rollman, B. L., Dew, M. A., et al. (2001). The association of late-life depression and anxiety with physical disability: A review of the literature and prospectus for future research. *American Journal of Geriatric Psychiatry, 9*, 113-135.

Lenze, E. J., Shear, M. K., Mulsant, B. H., & Reynolds, C. F. (2002). Anxiety disorders in late life: An evolving picture. *CNS Spectrums, 7*(11), 805-810.

Lenze, E. J., & Wetherell, J. L. (2011). A lifespan view of anxiety disorders. *Dialogues in Clinical Neuroscience, 13*, 381 - 399.

Lindesay, J. (1991a). Anxiety diorders in the elderly. In R. Jacoby & C. Oppenheimer (Eds.), *Psychiatry in the elderly*. Oxford: Oxford University Press.

Lindesay, J. (1991b). Phobic disorders in the elderly. *British Journal of Psychiatry, 159*, 531-541.

Lindesay, J. (1997). Phobic disorders and fear of crime in the elderly. *Aging & Mental Health, 1*, 81-85.

Lindesay, J., & Banerjee, S. (1993). Phobic disorders in the elderly: A comparison of three diagnostic systems. *International Journal of Geriatric Psychiatry, 8*(5), 387-393.

Lindesay, J., Briggs, K., & Murphy, E. (1989). The Guys/Age Concern Survey: Prevalence rates of cognitive impairment, depression, and anxiety in an urban elderly community. *British Journal of Psychiatry, 155*, 317-329.

Livingston, G., Watkin, V., Milne, B., Manela, M. V., & , & Katona, C. (1997). The natural history of depression and the anxiety disorders in older people: the Islington community study. *Journal of Affective disorders, 46*, 225 - 262.

Luchins, D. J., & Rose, R. P. (1989). Late-life onset of panic disorder with agoraphobia in three patients. *American Journal of Psychiatry, 146*, 920-921.

Lynch, T. R., Compton, J. S., Mendelson, T., Robins, C. J., & Krishnan, K. R. R. (2000). Anxious depression among the elderly: Clinical and phenomenological correlates. *Aging and Mental Health, 4*(3), 268 -.

Maddux, J. E. (1995). *Self-efficacy, adaptation and adjustment* (Plenum series in social/clinical psychology). New York: Plenum.

Malcarne, V. L., & Hansdottir, I. (2001). Vulnerability to anxiety disorders in childhood and adolescence. In J. Price & R. Ingram (Eds.), *Vulnerability to Psychopathology: Risk Across the Lifespan* (pp. 271–303). New York: Guilford Press.

Maller, R. G., & Reiss, S. (1992). Anxiety sensitivity and panic attacks: A longitudinal analysis. *Journal of Anxiety Disorders, 6*, 241-247.

Manela, M. V., Katona, C., & Livingston, G. (1996). How common are the anxiety disorders in old age? *Intenational Journal of Geriatric Psychiatry, 11*, 65-70.

Maser, J. D., & Cloninger, C. R. (1990). Comorbidity of anxiety and mood disorders: introduction and overview. In J. D. Maser & C. R. Cloninger (Eds.), *Comorbidity of Mood and Anxiety Disorders* (pp. 3-12). Washington, DC: American Psychiatric Press.

Mathuranath, P. S., Nestor, P. J., Berrios, G. E., Rakowicz, W., & Hodges, J. R. (2000). A brief cognitive test battery to differentiate Alzheimer's disease and frontotemporal dementia. *Neurology, 55*(11), 1613-1620.

McCabe, L., Cairney, J., Veldhuizen, S., Herrmann, N., & Streiner, D. L. (2006). Prevalence and correlates of agoraphobia in older adults. *The American Journal of Geriatric Psychiatry, 14*(6), 515.

McLachlan, G. J., & Peel, D. (2000). *Finite Mixture Models*. New York: Wiley.

McLennan, W. (1998). *Mental Health and Wellbeing: profile of adults, Australia, 1997*. Canberra: Australian Bureau of Statistics.

McMahon, F. J., Stine, C., Chase, G. A., Meyers, D. A., Simpson, S. G., & DePaulo, J. R. (1994). Influence of clinical subtype, sex, and lineality on age at onset of major affective disorder in a family sample. *American Journal of Psychiatry, 151*, 210-215.

Mendes de Leon, C. F., Seeman, T. E., Baker, D. I., Richardson. E. D., & Tinetti, M. E. (1996). Self-efficacy, physical decline , and change in functioning in community-living elder: A prospective study. *Journal of Gerontology: Social Sciences, 51*, 183- 190.

Menec, V. H., Chipperfield, J. G., & Perry, R. P. (1999). Self-perceptions of health: A prospective analysis of mortality, control, and health. *The Journals of Gerontology, 54*(2), P85-P93.

Merikangas, K. R., Stevens, D. E., Fenton, B., Stoalr, M., O'Malley, S., Woods, S. W., et al. (1998). Co-morbidity and familial aggregation of alcoholism and anxiety disorders. *psychological Medicine, 28*(4), 773-788.

Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy, 28*(6), 487–495.

Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology, 49*, 377-412.

Mohlman, J., de Jesus, M., Gorenstein, E. E., Kleber, M., Gorman, J. M., & Papp, L. A. (2004). Distinguishing generalized anxiety disorder, panic disorder, and mixed anxiety states in older treatment-seeking adults. *Journal of Anxiety Disorders, 18*(3), 275-290.

Mohlman, J., Gorenstein, E. E., Kleber, M., de Jesus, M., Gorman, J. M., & Papp, L. A. (2003). Standard and Enhanced Cognitive-Behavior Therapy for Late-Life Generalized Anxiety Disorder. *The American Journal of Geriatric Psychiatry, 11*(1), 24 - 32.

Molina, S., & Borkovec, T. D. (1994). The Penn State Worry Questionnaire: Psychometric properties and associated characteristics. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on Theory, Assessment, and Treatment* (pp. 265-283). New York: Wiley.

Mossey, J. M., & Shapiro, E. (1982). Self-rated health: A predictor of mortality among the elderly. *American Journal of Public Health, 72*(8), 800–808.

Newman, S. C., & Bland, R. C. (1994). Life events and the 1-year prevalence of major depressive episode, generalized anxiety disorder, and panic disorder in a community sample. *Comprehensive Psychiatry, 35*(1), 76-82.

Noyes, R., Clarkson, C., Crowe, R. R., Yates, W. R., & McChesney, C. M. (1987). A family study of generalized anxiety disorder. *American Journal of Psychiatry, 144*, 1019-1024.

Nunnally, J. O. (1978). *Psychometric theory*. New York: McGraw-Hill.

Nutt, D.-J. (2001). Neurobilogical mechanisms in generalized anxiety disorder. *Journal of Clinical Psychiatry, 62*(suppl 11), 22-27.

Orrell, M. W., & Davies, A. D. M. (1994). Life events in the elderly. *International Review of Psychiatry, 6*, 59-71.

Oster, G., Russell, M. W., Huse, D. M., Adams, S. F., & Imbimbo, J. (1987). Accident- and injury-related health care utilization among benzodiazepine users and nonusers. *Journal of Clinical Psychiatry, 48*(Suppl), 17-21.

Ouslander, J. G., Osterweil, D., & Morley, J. (1991). *Medical care in the nursing home*. New York: McGraw-Hill.

Pachana, N. A., & Byrne, G. J. A. (2005). Measurement of anxiety symptoms in older adults: The geriatric anxiety inventory. *Australian Journal of Psychology, 57*, 278-278.

Pachana, N. A., Byrne, G. J. A., Siddle, H., Koloski, N., Harley, E., & Arnold, E. (2007). Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics, 19*(1), 103-114.

Pallant, J. (2011). *SPSS survival manual: 4th Edition*. NSW: Allen & Unwin.

Palmer, B. W., McClure, F. S., & , & Jeste, D. V. (2001). Schizophrenia in late life: Findings challenge traditional concepts. *Harvard Review of Psychiatry, 9*, 51-58.

Parmelee, P. A., Katz, I. R., & Lawton, M. P. (1993). Anxiety and its association with depression among institutionalised elderly. *American Journal of Geriatric Psychiatry, 1*, 46-58.

Paterniti, S., Alperovitch, A., Ducimetiere, P., Dealberto, M. J., Lepine, J. P., & Bisserbe, J. C. (1999). Anxiety but not depression is associated with elevated blood pressure in a community group of French elderly. *Psychosomatic Medicine, 61*(1), 77-83.

Paykel, E. S. (1978). Contribution of life events to causation of psychiatric illness. *Psychological Medicine, 8*(2), 245-253.

Peterson, R. A., & Heilbronner, R. L. (1987). The anxiety sensitivity index:: Construct validity and factor analytic structure. *Journal of Anxiety Disorders, 1*(2), 117-121.

Peterson, R. A., & Reiss, S. (1987). *Test Manual for the Anxiety Sensitivity Index*. Orland Park, IL: International Diagnostic Systems.

Peterson, R. A., & Reiss, S. (1992). *Anxiety Sensitivity Index Manual* (2nd ed.). Worthington, OH: International Diagnostic Systems.

Phares, E. J. (1976). *Locus of control in personality*. Morristown, NJ: General Learning Press.

Prendant, K. M., & Lachman, M. E. (2001). Planning for the future: A life management strategy for increased control and life satisfaction in adulthood. *Psychology and Aging, 16*(2), 206-216.

Raj, B. A., Corvea, M. H., & Dagon, E. M. (1993). The clinical characteristics of Panic Disorder in the elderly: A retrospective study. *Journal of Clinical Psychiatry, 54*(4), 150-155.

Rapee, R. M. (2002). The development and modification of temperamental risk for anxiety disorders: Prevention of a lifetime of anxiety? *Biological Psychiatry, 52*, 947-957.

Rapee, R. M., Craske, M. G., Brown, T. A., & , & Barlow, D. H. (1996). Measurement of perceived control over anxiety-related events. *Behavior Therapy, 27*, 279-293.

Ray, W. A., Griffin, M. R., & Downey, W. (1989). Benzodiazepines of Long and Short Elimination Half-life and the Risk of Hip Fracture. *Journal of the American Medical Association, 262*(23), 3303-3307.

Regier, D. A., Boyd, J. H., Burke, J. D., Rae, D. S., Myers, J. K., Kramer, M., et al. (1988). One-Month Prevalence of Mental-Disorders in the United-States - Based on 5 Epidemiologic Catchment-Area Sites. *Archives of General Psychiatry, 45*(11), 977-986.

Regier, D. A., Myers, J. K., Kramer, M., Robins, L. N., Blazer, D. G., Hough, R. L., et al. (1984). The NIMH Epidemiologic Catchment Area program. Historical context, major objectives, and study population characteristics. *Archives of General Psychiatry, 41*(10), 934-941.

Regier, D. A., Narrow, W. E., & Rae, D. S. (1990). The epidemiology of anxiety disorders: The epidemiologic catchment area (ECA) experience. *Journal of Psychiatric Research, 24*(Supplement 2), 3-14.

Reich, J. W., Zautra, A. J., & Guarnaccia, C. A. (1989). Effects of disability and bereavement on the mental health and recovery of older adults. *Psychology and Aging, 4*, 57-65.

Reiss, S. (1991). Expectancy model of fear, anxiety, and panic. *Clinical Psychology Review, 11*, 141-153.

Reiss, S., & McNally, R. J. (1985). Expectancy model of fear. In S. Reiss & R. R. Bootzin (Eds.), *Theoretical issues in behavior therapy* (pp. 107-122). New York: Academy Press.

Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. *Behaviour Research and Therapy, 24*(1), 1-8.

Reynolds, C. F., Dew, M. A., Frank, E., Begley, A. E., Miller, M. D., Cornes, C., et al. (1998). Effects of age at onset of first lifetime episode of recurrent major depression on treatment response and illness course in elderly patients. *The American Journal of Psychiatry, 155*(6), 795-799.

Reynolds, C. F., Frank, E., Perel, J. M., Mazumdar, S., Dew, M. A., Begley, A., et al. (1996). High relapse rate after discontinuation of adjunctive medication for elderly patients with recurrent major depression. *American Journal of Psychiatry, 153*(11), 1418-1422.

Rodin, J. (1986). Aging and health: Effects of the sense of control. *Science, 233,* 1271-1276.

Roth, M. (1955). The natural history of mental disorder in old age. *Journal of Mental Science, 102*, 281 -301.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*(1), 1-28.

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*(1), 56-67.

Sable, J. A., & Jeste, D. V. (2001). Anxiety disorders in older adults. *Current Psychiatry, 3*(4), 302-307.

Sadavoy, J., & LeClair, J. K. (1997). Treatment of anxiety disorders in late life. *Canadian Journal of Psychiatry, 42*(Suppl 1), 28S-34S.

Sanderson, W. C., Beck, A. T., & Beck, J. (1990). Syndrome comorbidity in patients with major depression or dysthymia: prevalence and temporal relationships. *American Journal of Psychiatry, 147*, 1025-1028.

Sato, T., Bottlender, R., Schroter, A., & , & Moller, H. (2004). Psychopathology of early-onset versus late-onset schizophrenia revisited: an observation of 473 neuroleptic-naive patients before and after first-admission treatments. *Schizophrenia Research, 67*, 175-183.

Schaub, R. T., &, & Linden, M. (2000). Anxiety and Anxiety Disorders in the old and very old- Results from the Berlin Aging Study (BASE). *Comprehensive Psychiatry, 41*(2), 48-54.

Schmidt, N. B., Santiago, H. T., & Wernicke, R. (2001). Evaluating the etiology of Anxiety Sensitivity: Relation to cardiovascular perception and reactivity. *Journal of Psychopathology and Behavioral Assessment, 23*(2), 85-92.

Schneider, L. S. (1996). Overview of generalized anxiety disorder in the elderly. *Journal of Clinical Psychiatry, 57*(7), 34-45.

Schneier, F. R., Johnson, J., Hornig, C. D., Liebowwitz, M. R., & Weissman, M. M. (1992). Social phobia: Comorbidity and morbidity in an epidemiologic sample. *Archives of General Psychiatry, 49*, 282-288.

Schoevers, R. A., Beekman, A. T. F., Deeg, D. J. H., Jonker, C., & Van Tilburg, W. (2003b). Comorbidity and risk patterns of depression, generalized anxiety disorder, and mixed anxiety-depression in later life: results from the AMSTEL study. *Intenational Journal of Geriatric Psychiatry, 18*, 994-1001.

Schoevers, R. A., Deeg, D. J. H., van Tilburg, W., & Beekman, A. T. F. (2005). Depression and generalized anxiety disorder: co-occurrence and longitudinal patterns in elderly patients. *The American Journal of Geriatric Psychiatry, 13*(1), 31-39.

Seeman, T. E., Berkman, L. F., Charpentier, P. A., Blazer, D. G., Albert, M. S., & Tinetti, M. E. (1995). Behavioral and Psychosocial Predictors of Physical Performance: MacArthur Studies of Successful Aging. *Journal of Gerontology: Medical Sciences 50A*(4), M177-M183.

Seeman, T. E., Rodin, J., & Albert, M. (1993). Self-efficacy and cognitive performance in high-functioning olderf individuals. *Journal of Aging and Health, 5*, 455-474.

Segui, J., Marquez, M., Garcia, L., Canet, J., Salvador-Carulla, L., & Oritz, M. (1999). Differential clinical features of early-onste panic disorder. *Journal of Affective Disorders, 54*, 109-117.

Seligman, M. E. P., & Elder, G. (1986). Learned helplessnes and lifespan development. In A. B. Sorenstein, F. W. Weinert & S. L. (Eds.), *Human development and the life course: multidisciplinary perspectives*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Sembi, S., Tarrier, N., O'Neill, P., Burns, A., & Farragher, B. (1998). Does post-traumatic stress disorder occur after stroke: A preliminary study. *International Journal of Geriatric Psychiatry, 13*(5), 315-322.

Sheehan, D. V., Sheehan, K. E., & Minichiello, W. E. (1981). Age of onset of phobic disorders: a reevaluation. *Comprehensive Psychiatry, 22*, 554-553.

Sheikh, J. I. (2003). Anxiety in older adults: Assessment and management of three common presentations. *Geriatrics, 58*(5), 44 - 45.

Sheikh, J. I., King, R. J., & Taylor, C. B. (1991). Comparative Phenomenology of Early-Onset Versus Late-Onset Panic Attacks - a Pilot Survey. *American Journal of Psychiatry, 148*(9), 1231-1233.

Sheikh, J. I., & Salzman, C. (1995). Anxiety in the elderly - Course and treatment. *Psychiatric Clinics of North America, 18*(4), 871-&.

Sheikh, J. I., Swales, P. J., Carlson, E. B., & Lindley, S. E. (2004). Aging and panic disorder: Phenomenology, comorbidity, and risk factors. *The American Journal of Geriatric Psychiatry, 12*(1), 102-109.

Sheikh, J. I., Swales, P. J., King, R. J., Sazima, G. C., & Bail, G. (1998). Somatization in young versus older female panic disorder patients. *International Journal of Geriatric Psychiatry, 13*(8), 564-567.

Sheikh, J. I., & Yesavage, J. A. (1986a). Geriatric Depression Scale (GDS): Recent findings and development of a shorter version. In T. L. Brink (Ed.), *Clinical Gerontology: A Guide to Assessment and Intervention*. New York: Howarth Press.

Sheikh, J. I., & Yesavage, J. A. (1986b). Geriatric Depression Scale. Recent evidence and development of a shorter version. *Clinical Gerontologist, 5*(1-2), 165-173.

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., &, & Rogers, R. W. (1982). The Self-Efficacy Scale: Construction and Validation. *Psychological Reports, 51*, 663-671.

Shores, M. M., Glubin, T., Cowley, D. S., Dager, S. R., Roy-Byrne, P. P., & Dunner, D. L. (1992). The relationship between anxiety and depression: A clinical comparison of generalized anxiety disorder, dysthymic disorder, panic disorder, and major depressive disorder. *Comprehensive Psychiatry, 33*(4), 237-244.

Snowdon, J. (2001). Is depression more prevalent in old age? *Australian and New Zealand Journal of Psychiatry, 35*(6), 782-787.

Spielberger, C. D. (1975). Anxiety: State-trait process. In C.D. Spielberger & I. G. Sarason (Eds.), *Stress and Anxiety* (Vol. 1, pp. 115-143). Washington D.C.: Hemisphere.

Spielberger, C. D. (1985). Assessment of state and trait anxiety: Conceptual and methodological issues. *Southern Psychologist, 2*(4), 6-16.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory (STAI)*. Palo Alto, CA.: Consulting Psychologist Press.

Spitzer, R. L., Williams, J., Gibbon, M., & First, M. B. (1990). *Structured Clinical Interview for DSM-III-R-Patient Edition (SCID-P, Version 1.0)*. Washington, D.C.: American Psychiatric Press.

SPSS Inc. (2005). SPSS for Windows, Rel. 14.0. Chicago, Ill: SPSS Inc.

SPSS Inc. (2008). SPSS for Windows, Rel. 16.0. Chicago, Ill: SPSS Inc.

Stanley, M. A., & Beck, J. G. (2000). Anxiety Disorders. *Clinical Psychology Review, 20*(6), 731-754.

Stanley, M. A., Beck, J. G., & Glassco, J. W. (1996). Treatment of Generalized Anxiety in older adults: A preliminary comparison of cognitive-behavioral and supportive approaches. *Behavior Therapy, 27*, 565-581.

Stanley, M. A., Beck, J. G., Novy, D. M., Averill, P. M., Swann, A. C., Diefenbach, G. J., et al. (2003). Cognitive-behavioral treatment of late-life generalized anxiety disorder. *Journal of Consulting and Clinical Psychology, 71*(2), 309-319.

Stanley, M. A., Beck, J. G., & Zebb, B. J. (1996). Psychometric properties of four anxiety measures in older adults. *Behaviour Research and Therapy, 34*(10), 827-838.

Stanley, M. A., Diefenbach, G. J., & Hopko, D. R. (2004). Cognitive behavioral treatment for older adults with generalized anxiety disorder - A therapist manual for primary care settings. *Behavior Modification, 28*(1), 73-117.

Stanley, M. A., Hopko, D. R., Diefenbach, G. J., Bourland, S. L., Rodriguez, H., & Wagener, P. (2003). Cognitive-behavior therapy for late-life anxiety disorders in primary care. *The American Journal of Geriatric Psychiatry, 11*(1), 92-96.

Stanley, M. A., & Novy, D. M. (2000). Cognitive-behavior therapy for Generalized Anxiety in late-life: An evaluative overview. *Journal of Anxiety Disorders, 14*(2), 191-207.

Stanley, M. A., Novy, D. M., Bourland, S. L., Beck, J. G., & Averill, P. M. (2001). Assessing older adults with generalized anxiety: a replication and extension. *Behaviour Research and Therapy, 39*, 221-235.

Stanley, M. A., Novy, D. M., Hopko, D. R., Beck, J. G., Averill, P. M., & Swann, A. C. (2002). Measures of self-efficacy and optimism in older adults with generalized anxiety. *Assessment, 9*(1), 70-81.

Starcevic, V., & Bogojevic, G. (1999). The concept of generalized anxiety disorder: between the too narrow and too wide diagnostic criteria. *Psychopathology, 32*(1), 5-11.

Starcevic, V., Uhlenhuth, E. H., Kellner, R., & Pathak, D. (1993). Comorbidity and panic disorder:II. Chronology of appearance and pathogenic comorbidity. *Psychiatry Research, 46*, 285-293.

Stein, M. B., Tancer, M. E., Gelernter, C. S., Vittone, B. J., & Uhde, T. W. (1990). Major depression in patients with social phobia. *American Journal of Psychiatry, 147*, 637-639.

Stevens, N. L., & Andersson, L. (1996). Overprotection by parents and anxiety in later life. *Journal of Mental Health and Aging, 2*, 39-50.

Tabachnik, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics* (4th ed.). Boston: Allyn & Bacon.

Taylor, S., Koch, W. J., & Crockett, D. J. (1991). Anxiety sensitivity, trait anxiety, and the anxiety disorders. *Journal of Anxiety Disorders, 5*(4), 293-311.

Teachman, B. A., Siedlecki, K. L., & Magee, J. C. (2007). Aging and symptoms of anxiety and depression: Structural invariance of the tripartite model. *Psychology and Aging, 22*(1), 160-170.

Tinetti, M. E., Richman, D., & Powell, L. (1990). Falls efficacy as a measure of fear of falling. *Journal of Gerontology: Psychological Sciences, 45*, 239-243.

van Balkom, A. J. L. M., Beekman, A. T. F., de Beurs, E., Deeg, D. J. H., van Dyck, R., & van Tilburg, W. (2000). Comorbidity of the anxiety disorders in a community-based older population in the Netherlands. *Acta Psychiatrica Scandinavica, 101*, 37-45.

Van den Berg, M. D., Oldehinkel, A. J., Bouhuys, A. L., Brilman, E. I., Beekman, A. T. F., & Ormel, J. (2001). Depression in later life: three etiologically different subgroups. *Journal of Affective Disorders, 65*, 19-26.

Van Hout, H. P. J., Beekman, A. T. F., De Beurs, E., Comijs, H. C., Van Marwijk, H., De Haan, M., et al. (2004). Anxiety and the risk of death in older men and women. *The British Journal of Psychiatry, 185*, 399-404.

van Zelst, W. H., de Beurs, E., Beekman, A. T. F., Deeg, D. J. H., & van Dyck, R. (2003). Prevalence and risk factors of posttraumatic stress disorder in older adults. *Psychotherapy and Psychosomatics, 72*, 333-342.

Venturello, S., Barzega, G., Maina, G., & Bogetto, F. (2002). Premorbid conditions and precipitating events in early-onset panic disorder. *Comprehensive Psychiatry, 43*(1), 28-36.

Vink, D., Aartsen, J., & Schoevers, R. A. (2008). Risk factors for anxiety and depression in the elderly: A review. *Journal of Affective Disorders, 106*(1-2), 29-44.

Waller, K. V., & Bates, R. C. (1992). Health locus of control and self-efficacy beliefs in a healthy elderly sample. *American Journal of Health Promotion, 6*, 302-309.

Watkins, L. L., Grossman, P., Krishnan, R., & Blumenthal, J. A. (1999). Anxiety reduces baroreflex cardiac control in older adults with major depression. *Psychosomatic Medicine, 61*(3), 334-340.

Weissman, M. M., Myers, J. K., Tischler, G. L., Holzer, C. E., Leaf, P. J., Orvaschel, H., et al. (1985). Psychiatric-Disorders (DSM-III) and Cognitive Impairment among the Elderly in a United-States Urban-Community. *Acta Psychiatrica Scandinavica, 71*(4), 366-379.

Welch, D. C., & West, R. L. (1995). Self-efficacy and mastery: Its application to issues of environmental control, cognition and aging. *Developmental Review, 15*, 150-171.

Wengel, S. P., Burke, W. J., Ranno, A. E., & Roccaforte, W. H. (1993). Use of benzodiazepines in the elderly. *Psychiatric Annals, 23*(6), 325-331.

Wetherell, J. L. (2000). *Treatment of Generalized Anxiety Disorder in Older Adults.* Unpublished Doctor of Philosophy (Psychology), University of Southern California, California.

Wetherell, J. L., Gatz, M., & Craske, M. G. (2003). Treatment of generalized anxiety disorder in older adults. *Journal of Consulting and Clinical Psychology, 71*(1), 31-40.

Wetherell, J. L., Gatz, M., & Pedersen, N. L. (2001). A longitudinal analysis of anxiety and depressive symptoms. *Psychology and Aging, 16*(2), 187-195.

Wetherell, J. L., Hopko, D. R., Diefenbach, G. J., Averill, P. M., Beck, J. G., Craske, M. G., et al. (2005). Cognitive-behavioral therapy for late-life generalized anxiety disorder: Who gets better? *Behavior Therapy, 36*(2), 147-156.

Wetherell, J. L., Le Roux, H., & Gatz, M. (2003). DSM-IV criteria for generalized anxiety disorder in older adults: distinguishing the worried from the well. *Psychology and Aging, 18*(3), 622-627.

Wetherell, J. L., Maser, J. D., & van Balkom, A. (2005). Anxiety disorders in the elderly: outdated beliefs and a research agenda. *Acta Psychiatrica Scandinavica, 111*(6), 401-402.

Wetherell, J. L., Sorrell, J. T., Thorp, S. R., & Patterson, T. L. (2005). Psychological interventions for late-life anxiety: A review and early lessons from the CALM study. *Journal of Geriatric Psychiatry and Neurology, 18*(2), 72-82.

Wisocki, P. A., Handen, B., & Morse, C. K. (1986). The Worry Scale as a measure of anxiety among home bound and community active elderly. *The Behavior Therapist, 5*, 91–95.

Wittchen, H. U., Carter, R. M., Pfister, H., Montgomery, S. A., & Kessler, R. C. (2000). Disabilities and quality of life in pure and comorbid generalized anxiety disorder and major depression in a national survey. *International Clinical Psychopharmacology, 15*(6), 319–328.

Wittchen, H. U., Zhao, S., Kessler, R. C., & Eaton, W. W. (1994). DSM-III-R generalised anxiety disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 51*, 355-364.

Wolinsky, F. D., & Johnson, R. J. (1992). Perceived Health Status and Mortality Among Older Men and Women. *Journal of Gerontology, 47*(6), S304-S312.

Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., et al. (1982-1983). Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research, 17*(1), 37-49.

APPENDIX A

Addenbrooke's Cognitive Examination (ACE)

ADDENBROOKE'S COGNITIVE EXAMINATION

Name :	Years of education : _____
Date of birth :	Date of testing : __/__/__
Reference no. :	Tester's name : _____

All instructions to the tester are in italics. **All instructions to be said aloud to the patient are in bold non-italic print.**

ORIENTATION

Ask the subject the following questions and score a point for each correct answer. Record all errors.

Q1a) **What is the Year** _____
Season _____
Date* _____
Day _____
Month _____

Q1b) **Where are we Country** _____
County / State _____
Town _____
Hospital/building _____
Floor/Level* _____

**Allow an error of ± 2*

Total score for orientation [*Score* 0 - 10] ☐ O

ATTENTION/CONCENTRATION

Q2) *Tell the subject* **I am going to ask you to recall the names of three things.**
Say aloud: **lemon, key, ball.** *Then ask the subject to repeat them. Give one point for each correct answer at first attempt only.*
If score<3 repeat all three items until the subject learns them all

[0 - 3] ☐

Maximum trials allowed = 5.

Q3) *Ask the subject to* **take away 7 from 100.**
1. *Give one point only for the right answer (93).*
2. *If the subject's answer is wrong then tell the correct answer.*
3. *Ask the subject to* **now take away 7 from** *the correct answer* **(93).**

Repeat steps 1 to 3 for a total of 5 substractions (93, 86, 79, 72, 65). Score the total number of correct subtractions.
If score<5 then ask the subject to **Spell 'WORLD' backwards.** *Score the number of letters in the correct order, eg dlorw = 4.*
Take score of better of the two tasks. Record errors:

_____ [0 - 5] ☐

MEMORY

Q4) *Ask the subject to* **recall the names of the 3 things learned earlier** *in question 2. Score one point for each correct answer.* [0 - 3]

Q5) *Anterograde Memory: Tell the subject* **I will read a name and address and ask you to repeat it when I have finished.** *Now read aloud the following name and address. Score one point for each element recalled correctly. Regardless of the score after the first trial, repeat the instruction and the task twice in exactly the same way. Record scores for each of the three trials.*

	1st trial	2nd	3rd	5 min delay
Peter Marshall	___	___	___	___
42 Market Street	_____	_____	_____	_____
Chelmsford	___	___	___	___
Essex	__	__	__	__
	/7	/7	/7	/7

Trial 1-3 [0 - 21] ☐
5 min delay [0 - 7] ☐ M

Q6) *Retrograde Memory: Score one point for each correct answer and record errors.* **Tell me the full name of the prime minister** _____
The last prime minister _____
The Leaderof the Opposition _____
The United States of America _____ [0 - 4]

VERBAL FLUENCY

Q7) *Letter: Ask the subject to*: **tell me all the words you can think of, but not people and places, beginning with the letter P.** *Time the subject for 1 minute and record all answers in the space provided below. Error types: perseverations and intrusions.*

Q8) *Category: Say:* **Now tell me the names of as many animals as you can, beginning with any letter of the alphabet.** *Time the subject for 1 minute and record all responses in the space provided below. Error types: perseverations and intrusions.*

P		**Animals**	
(Start here)	*(Continue)*	*(Start here)*	*(Continue)*

Raw Score		Scaled Score
P	Animal	
> 17	> 21	7
14-17	17-21	6
11-13	14-16	5
8-10	11-13	4
6-7	9-10	3
4-5	7-8	2
< 4	< 7	1

Record the total number of responses. To calculate the raw score give one point for each correct response and exclude all repetitions. Enter the scaled scores using the table shown above.

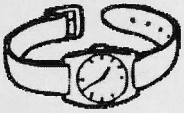
P: Total response____ Raw score _____ Scaled Score [0 - 7] =
Animals: Total response____ Raw score _____ Scaled Score [0 - 7] =
Total Scaled Score [0 - 14] ☐ V

LANGUAGE

Q9) *Naming: Show the subject the following two line-drawings and ask him/her to name each of them. Record responses and errors. Give one point for each correct response.*

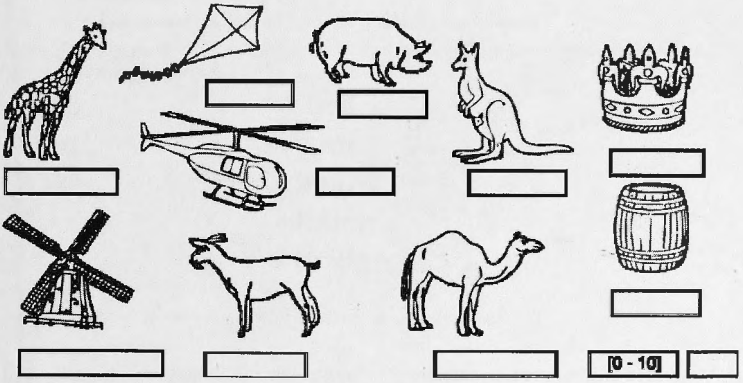
[0 -2]

Q10) *Naming: Show the subject the following ten line-drawings and ask him/her to name each of them. Record responses and errors. Give one point for each correct response. Allow close synonyms (e.g. tub*



for barrel; coronet for crown; dromedary for camel etc)

[0 -10]



[0 - 10]

Q11) *Comprehension (one-stage): Askt the subject to* **please obey the following simple commands.**

- **point to the door**
- **point to the ceiling**

[0 - 2]

Show the subject the following instruction and ask him/her to **read this aloud and obey it.**

CLOSE YOUR EYES

Score one point if performed correctly. [0 - 1]

Q12) *Comprehension (3-stages): Give the subject a piece of paper and tell him to* **take this paper in your hands. Fold it in half. Then put the paper on the floor.**
Score one point for each correctly performed step. [0 - 3]

Q13) *Comprehension (complex grammar): Ask the subject to* **please obey the following commands.**

- **point to the ceiling then the door**
- **point to the door after touching the bed/desk**

Score one point for each correctly performed command. [0 - 2]

Q14) *Repetition (single words): Ask the subject to* **repeat each of these words after me.** *Score one point for each correct repetition. Allow only one repetition.*

- **brown**
- **conversation**
- **articulate** [0 - 3]

Q15) *Repetition (phrases): Ask the subject to* **repeat each of these phrases after me.** *Allow only one repetition.*

- **No ifs, ands, or buts** [0 - 1]
- **The orchestra played and the audience applauded** [0 - 1]

Q16) *Reading (regular): Ask the subject to* **read each of these words aloud** *and show him/her the following five words.*

- **shed**
- **wipe**
- **board**
- **flame**
- **bridge**

Score one point only if all five words are read correct. [0 - 1]

Q17) *Reading (irregular): Ask the subject to* **read each of these words aloud** *and show him/her the following five words.*

- **sew**
- **pint**
- **soot**
- **dough**
- **height**

Score one point only if all five words are read correct. [0 - 1]

Q18) *Writing: Ask the subject to* **make up a sentence and write it down in the space below.** *If stuck suggest a topic e.g. weather, journey. Score one point if the sentence has a correct subject and verb and is meaningful.*

_____

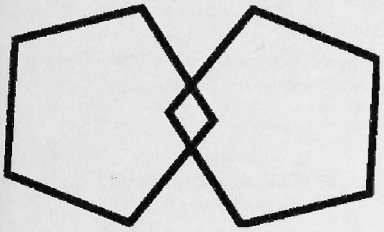
_____

[0 - 1]

Q19) *Now to check delayed recall ask the subject* **Can you tell me the name and address that I told you and that you practised at the beginning of the test.** *Record points, scores and errors as for question 5 in the space provided in question 5 on page 1.*

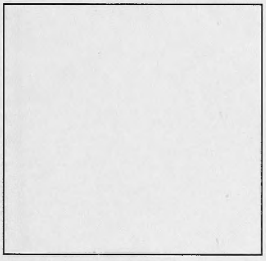
VISUOSPATIAL ABILITIES

Q20) *Overlapping pentagons: Show the subject the following figure and ask him/her to* **copy this diagram in the space provided next to it.**



Score one point if copied correct. [0 -1] ☐

Q21) *Wire cube: Show the subject the following figure and ask him/her to* **copy this diagram in the space provided next to it.**



Score one point if copied correct. [0 -1] ☐

Q22) ***Clock:*** *Ask the subject to* **draw a clock-face with numbers and the hands at ten past five.**

Score one point each, for correct circle, numbering of the clock-face and position of the hands. [0 - 3] ☐

***CHECK**: Have you tested and recorded the delayed recall for name and address in Q 5 on page 1?*

OVERALL SCORES

MMSE* =**

ACE =**

VLOM-RATIO :

If < 2.2: FTD

If > 3.2: AD

$$\frac{V + SL^*}{O + M} = \frac{\quad}{\quad} =$$

****Sum of scores entered in the shaded boxes. ** Sum of scores entered in all boxes. *Sum of scores entered in all boxes form Q9 to Q18 = SL*

MMSE – Scored out of 30
ACE scored out of 100

APPENDIX B

Research Media Release

THE AUSTRALIAN NATIONAL UNIVERSITY

MEDIA RELEASE

TUESDAY 5 JULY 2005

ANXIETY IN OVER 55's — NEW ANU STUDY

New ANU research aims to gain an understanding of first-onset anxiety in late life, and investigate the causes and treatments of anxiety in older people, which potentially effects up to 10 per cent of people over 55 years of age.

Researchers are seeking residents over 55 years in Canberra, Queanbeyan and Goulburn to participate in a new study of anxiety problems, in which they will be provided with a free, effective non-drug treatment for the management of anxiety problems.

"Whilst depression is becoming increasingly recognised in older people, anxiety in late-life is an under-studied area, and can often be misidentified as depression," according to psychology PhD student Ms Maaria Haque. "This is partly because depression is also usually present in those experiencing anxiety problems. There is increasing evidence that like depression, anxiety can occur for the first time later in life, without the individual having to have suffered it previously."

"Examples of anxiety problems include excessive concern or worry about a range of issues, fear and/or avoidance of certain situations, events and activities, sudden and intense fear or apprehension (panic), and concern about presenting in social situations," Ms Haque said. "These problems can cause a great deal of distress in anxious individuals, however, there are good treatments not involving medication that are available."

"Anxiety problems and responses to treatment in late life may be different for people who have had these problems since early adulthood than for those who experience such problems for the first time later in life. So this study will look at previous history of anxiety problems, and life factors that may contribute specifically to the first onset of anxiety — for example job or financial insecurity, or health related factors."

Local participants in the study would be required to complete an initial assessment involving an interview and some questionnaires, and would then complete a 12-week treatment program of cognitive behaviour therapy — a non-drug therapy found to be effective for the management of anxiety problems — on an individual basis.

The information from this study would be invaluable, according to Dr Jeff Looi, Director of the Research Centre for the Neurosciences of Ageing, at the older persons mental health service.

"We are just beginning to realise the extent and complexity of mood disorders, such as depression and anxiety, as people age," Dr Looi, also a senior lecturer at the ANU Medical School, said. "There is an increasing amount of research particularly in the area of depression. This study of anxiety would complement these studies and provide significant new data for researchers and clinicians on the onset and treatment of people with anxiety problems in late life."

People over 55 years of age who believe they might be suitable for the study or are interested in participating as a control subject and would like more information can contact Ms Haque on 02 6125 3972 during business hours.

ANU MEDIA OFFICE CONTACT: Amanda Morgan (02) 6125 5575 / 0416 249 245

Website: www.anu.edu.au/mac/media/index.html

APPENDIX C

Participant Recruitment Flyer

DO YOU SUFFER FROM ANXIETY? ARE YOU OVER 55?

A NEW RESEARCH PROJECT AT THE ANU

The purpose of this project is to gain a better understanding of anxiety and worry in older people's lives, and any links there may be with difficult life events depending on when these events occurred. The project will also examine which types of treatment are more effective in managing anxiety, and whether a person's response to treatment depends on when the anxiety problem began.

The study will be conducted in two stages. If you choose to participate in this study, the first stage will involve attending an interview and answering some questions about yourself, your family and medical history, and two simple physical measurements including a measure of your blood pressure. You will also be asked to complete some questionnaires that will ask you how you've been feeling lately. These will take approximately 45 minutes. Should you be considered suitable, in the second stage of the study you will be invited to participate in a 12-week treatment programme which will offer personalised attention for your anxiety and worry problems.

Who can participate in the study?

- Individuals aged 55 years and over
- Individuals experiencing symptoms of anxiety such as worry, muscle tension, panic, and sleep disturbance

How can I Participate?

If you are interested in participating or would like more information about the study, please contact Maaria Haque at the ANU (Tel: 6125 3972) to arrange an interview.

APPENDIX D

Initial Assessment Interview Schedule

Date:
Client ID number:

Initial Assessment Interview Schedule

Hi, My name is Maaria Haque, and I am an intern psychologist. Part of being an intern is that I have a supervisor who monitors my work. This is done by video or audio-taping the sessions. The only people who will see and/or hear the tape are my supervisor and myself. So do you mind if we tape these sessions?

Have you had a chance to read through the information I sent you? Is there anything that you don't understand, or you would like for me to go through with you? (*Ensure that the participant has read the information and consent form, and go through the information outlined in both)*

Before we start, I'd just like to go over some of the information provided in the information sheet, and answer any questions you might have. As outlined in the information sheet, as part of the interview, I'll be asking you some questions about you medical history. With your permission, I would like to contact your G.P. This is primarily done so that all health professionals involved in your care are informed of your medication and your health status, so we can better manage your treatment. I will only contact him/her with your permission, and we will only discuss information regarding your medication and your physical/medical health. If you do not want me to contact your G.P, this will not affect your ability to take part in this study or receive treatment from any other service provider. Do you have any questions about that?

Is it ok if I contact your G.P after our interview? *Y* *N*

As part of the interview, I will also be recording some data on your heart rate and skin conductance. In order to get accurate measures, I will need you to answer some questions about your activities this morning, and to record your height at the end of the interview.

Confidentiality between you, me, and my supervisor is preserved as much as possible, however, in the case that I feel there is a risk of harm to yourself or others, then I am obliged to involve other relevant agencies or professionals.

Do you have any questions?
(Ensure that participants have understood both the information and consent form, and that the consent form has been signed by the participant)

My aim today is to get an understanding of who you are and your experiences, and whether there is a link between various events in life, and how people feel. In order to do so, I'll be asking you some questions about what brought you here today, and some questions about yourself, your family, and your health. Does that sound ok? Do you have any questions?

1. I'm going to begin by asking you some general questions, which involve memory and recall, followed by some questions about your general attitude towards life at the moment.

Start with Administration of the Addenbrookes Cognitive examination and the GDS

2. In this next part of the interview, I'll be asking you a number of questions about different experiences in your life, and your thoughts and feelings regarding these. This part of the interview is expected to go for about _____

   Please let me know if you need a break or need to stop at any point during the interview.

   Do you have any questions?

Begin administration of the ADIS-IV-L

Following ADIS-IV-L, check if participant is tired, or needs a break. If they are happy to continue with a break, do so, continuing with the assessment of their family and personal history, followed by the negative events questionnaire. If not, reschedule a second interview for the remainder of the assessment.

3. In this next part of the interview, I want to ask you some questions about you, your family, and your medical history in more detail. I'm going to start by asking you some questions about what it was like growing up.

Personal History

Developmental history
(*Attach additional notes where necessary*)

1. What was your upbringing/childhood like?

2. What were your parents like? (*Inquire as to who they are and what they do/did*)

3. What was/is your relationship with your parent/s (carer/s) like?

4. Are they a part of your life today? *If so*, In what way are they involved?

5a. Do you have brothers and/or sisters? YES NO

b. If yes, *Inquire as to how many, who they are, age differences*)

6. What was/is (name of sibling) like? (*Inquire for all siblings*)

7. What was/is your relationship with (name of sibling) like? (*Inquire for all siblings, i.e., are they still close, amount of contact*)

Education and employment

1. What was your school life like?/ How did you fit into school? (*Inquire as to where they went to school for primary, secondary and tertiary education, where relevant)*

2a. Do you work/ have you worked in the past? YES NO

If yes,

b. What do you do/ have you done (*enquire about all occupational experiences*)

c. Do you enjoy your work? YES NO

Comments

Relationships/Marital history

1a. Are you / have you been in a long-term relationship? YES NO

If yes,

b. How long have you and your partner been together? _____

c. How would you describe your partner and your relationship? (*Inquire as to how they feel about their relationship, current state of the relationship*)

d. Is your partner supportive of you /Do you find your partner a source of support?

YES NO

2. If current partner is not the first partner, What was your previous relationship like? (*Inquire about partner, type of relationship, supportive nature, similarity/ dissimilarity to current relationship*)

Family constellation

1a. Do you have children? (*Inquire about own family life*) YES NO

Comments

If Yes,

b. How many? (*Inquire as to who they are, age differences, what they do*)

2a. What is your relationship with_____ like? (*Inquire for all children, e.g., Are you still close*)

b. Are they a part of your life today? (e.g., *Amount of contact*)

3a. Would you say that you get the emotional help and support you need from your family?

YES NO

b. Do you feel that you can confide in/talk about your problems with your family?

c. Does your family help you to make important decisions?

YES NO

Comments

4a. Do you have grandchildren? YES NO

b. If yes, How many? (*Inquire as to nature of relationship*)

5a. Are there other family members such as aunts/uncles, nieces/nephews that you consider an important part of your life or are close to?

YES NO

b. If yes, Whom?

c. What is your relationship with them like? (*Inquire as to nature of relationship, amount of contact, level of support)*

6.

Family History (Genogram) ○ Female ≠ Divorced/ separated ▪ Male x - Deceased ● Affected	
Paternal Family	Maternal Family

Friendships and social groups

1. What is your social network like? (*Inquire as to who makes up this social network, frequency of contact*)

2. How would you describe your friends and your relationship? (*i.e., are you able to confide in your friends and/or are you able to talk to friends about any of your problems?)*

3. Do you find your friends to be a source of support? YES NO

Comments

Is there anything about your friends, family or relationship that you would like to add, or that we have not covered?

Health and Medical History

Now I am going to ask you some questions about your current health status and your views about your health, as well as your medical history, and medication use.

If the client has given consent to contact and exchange information with their G.P, then,

1. Who is your general practitioner?

   _____

2. How often do you see your G.P? _____

3. Are you involved with and/or receiving treatment from any other services?

   Y N

If yes, other services currently involved in clients care: (can tick more than one)

- □ Department of Community Services
- □ Family Support Agency
- □ Aged Care Service (Aged and community care)
- □ Mental Health ACT
- □ Older Persons Mental Health ACT
- □ Other

Contact Details:

_____

_____

_____

Health status

4. Do you experience any physical problems on a regular basis? (e.g., headaches, extreme tiredness, stomach aches?) Y N

   a. If yes, specify (*type of problem, since when*)

   _____

   _____

   b. How often do you experience (*type of problem*)?

0---------1---------2---------3---------4---------5---------6---------7---------8

Never *Rarely* *Occasionally* *Frequently* *Constantly*

   c. When you experience this problem, how severe is/are the (*name problem*)?

0---------1---------2---------3---------4---------5---------6---------7---------8

None *Mild* *Moderate* *Severe* *Very severe*

5. Do you or have you had a chronic medical/physical illness? Y N

   a. If yes, specify (*type of illness, when this illness began*)

   _____

   _____

   b. What is the current status of (*illness*)? *(i.e is it ongoing, are you receiving treatment and if so, what kind, has this been treated or subsided*)

   _____

   _____

6. Do you experience any physical pain? Y N

If yes, what kind of pain (where)? _____

When did this begin?

_____

7. The following questions are about activities that you might do in a typical day. Does your health now your limit your ability to do any of these activities? If so, how much? (*Write the number on the corresponding line according to the following scale*)

Activities	**Not at all limited**	**Limited a little**	**Limited a Lot**
a. Vigorous activities, such as jogging or running, lifting heavy objects, or participating in sports	1	2	3
b. Moderate activities, such as pushing a vacuum cleaner, moving furniture, bowling, or playing golf.	1	2	3
c. Light activities, such as walking	1	2	3
d. Climbing stairs	1	2	3
e. Bending, kneeling, or stooping	1	2	3
f. Bathing and dressing yourself	1	2	3
g. Other?	1	2	3

Medical conditions

8. Do you have any problems with your hearing and/or vision (*e.g., do you wear glasses, have cataracts, wear a hearing aid*)? Y N

   a. If yes, specify

   _____

   _____

Some medical conditions can mimic or influence the symptoms of anxiety.

9. Do you have a history of any of the following medical conditions:

Cardiovascular conditions

a. Congestive heart failure	Y	N
b. Pulmonary embolism	Y	N
c. Angina	Y	N
d. Arrhythmias	Y	N
e. High/low blood pressure	Y	N

Endocrine conditions

f. Hyperthyroidism	Y	N
g. Hypothyroidism	Y	N
h. Systemic lupus erythematosus	Y	N
i. Anemia	Y	N

Respiratory conditions

j. Asthma	Y	N
k. Chronic obstructive pulmonary disease	Y	N
l. Pneumonia	Y	N

Do you suffer from:

m. Arthritis	Y	N
n. Rheumatism	Y	N
o. Diabetes	Y	N
p. Other?	Y	N

Specify, _____

_____

10. Is there a family history of any of these problems? Y N

    If yes, specify: _____

    _____

Current Medication

Some medications can mimic or influence the symptoms of anxiety, and measures of physiological reactivity.

11. Are you currently taking any of the following medications:

    a. Psychiatric medication Y N
    b. Prednisolone (Prelone syrup, Blephamide eyedrops, Hydeltra/Hydeltrasol) Y N
    c. Metatyrapone Y N
    d. Phenytoin (Dilantin) Y N
    e. Thyroid hormones Y N
    f. Estrogen Y N
    g. Diuretics Y N

12. Are you currently taking any other medications, prescribed and non-prescribed, that have not been mentioned above? When did you start taking this?

Prescriber:	Medication/Dosage:	Comments

Adverse drug effects

13. Have you ever experienced any problems with any medications (prescribed and non-prescribed), such as side effects or withdrawal problems? Y N

    a. If yes, specify

    _____

    _____

14. Do you have any allergies? Y N

    a. If yes, specify

    _____

    _____

Substance use

15. Use of various substances can also mimic symptoms of anxiety, as well as effect measures of physiological reactivity. In the next section, I'm going to ask you some questions about the use, including the amount and frequency of use of the following substances.

Drug Category	Pattern of use		Recent and past use				
	Ever used	Used in past month	Last date used	Drug Name	Typical amount used/day	Frequency of use	Comments
Nicotine	No ☐ Yes ☐	No ☐ Yes ☐			Cigs	/week	
Caffeine (e.g. coffee, tea, cola, chocolate)	Not required	No ☐ Yes ☐				/week	
Alcohol	No ☐ Yes ☐	No ☐ Yes ☐			Drinks	/week	
Cannabis	No ☐ Yes ☐	No ☐ Yes ☐				/week	
Stimulants	No ☐ Yes ☐	No ☐ Yes ☐				/week	
Opiates (Codeine, Pethidine, Morphine, Methadone, Palfium, Endone)	No ☐ Yes ☐	No ☐ Yes ☐				/week	
Benzodiazepines (Valium, Mogadon, Serepax, Librium, Euhypnos, Xanax, Normison, Rohypnol)	No ☐ Yes ☐	No ☐ Yes ☐			Tablets	/week	
Hallucinogens	No ☐ Yes ☐	No ☐ Yes ☐			Tablets	/week	
Inhalants	No ☐ Yes ☐	No ☐ Yes ☐				/week	
Other (Please specify)	No ☐ Yes ☐	No ☐ Yes ☐				/week	

Perceived Health (reverse score following items)

16. For your age, in general, would you say your health is:

1----------2----------3----------4----------5
Excellent Very good Good Fair Poor

17. Compared to one year ago, in general, how would you rate your health now?

Much better than one year ago	1
Somewhat better than one year ago	2
About the same as one year ago	3
Somewhat worse than one year ago	4
Much worse than one year ago	5

Following completion of assessment of history, check if participant is tired, or needs a break. If they are happy to continue with a break, do so, continuing with the administration of the negative events questionnaire.

APPENDIX E

Geriatric Anxiety Inventory (GAI)

Date:
ID:

GAI: Please answer the items according to how you've felt in the last week. Tick the circle under AGREE if you mostly agree that the item describes you; tick the circle under DISAGREE if you mostly disagree that the item describes you.

		AGREE	DISAGREE
1	I worry a lot of the time.	O	O
2	I find it difficult to make a decision.	O	O
3	I often feel jumpy.	O	O
4	I find it hard to relax.	O	O
5	I often cannot enjoy things because of my worries.	O	O
6	Little things bother me a lot.	O	O
7	I often feel like I have butterflies in my stomach.	O	O
8	I think of myself as a worrier.	O	O
9	I can't help worrying about even trivial things.	O	O
10	I often feel nervous.	O	O
11	My own thoughts often make me anxious.	O	O
12	I get an upset stomach due to my worrying.	O	O
13	I think of myself as a nervous person.	O	O
14	I always anticipate the worst will happen.	O	O
15	I often feel shaky inside.	O	O
16	I think that my worries interfere with my life.	O	O
17	My worries often overwhelm me.	O	O
18	I sometimes feel a great knot in my stomach.	O	O
19	I miss out on things because I worry too much.	O	O
20	I often feel upset.	O	O

APPENDIX F

The Penn State Worry Questionnaire (PSWQ)

Date: _____

Client ID:_____

The Penn State Worry Questionnaire

Enter the number that best describes how *typical* or characteristic each item is of you, putting the number next to the item.

1---------- 2---------- 3---------- 4----------5

Not at all Typical — Somewhat Typical — Very Typical

___ 1. If I don't have enough time to do everything I don't worry about it.

___ 2. My worries overwhelm me.

___ 3. I don't tend to worry about things.

___ 4. Many situations make me worry.

___ 5. I know I shouldn't worry about things, but I just can't help it.

___ 6. When I am under pressure I worry a lot.

___ 7. I am always worrying about something.

___ 8. I find it easy to dismiss worrisome thoughts.

___ 9. As soon as I finish one task, I start to worry about everything else I have to do.

___ 10. I never worry about anything.

___ 11. When there is nothing more I can do about a concern, I don't worry about it anymore.

___ 12. I've been a worrier all my life.

___ 13. I notice that I have been worrying about things.

___ 14. Once I start worrying, I can't stop.

___ 15. I worry all the time.

___ 16. I worry about projects until they are all done.

APPENDIX G

The Geriatric Depression Scale (GDS-15)

Date:

ID:

(GDS- Short Form)

Circle the response that best describes how you feel in response to each of the following statements

1. Are you basically satisfied with your life?	Yes / No
2 Have you dropped many of your activities and interests?	Yes / No
3 Do you feel that your life is empty?	Yes/ No
4 Do you often get bored?	Yes / No
5 Are you in good spirits most of the time?	Yes / No
6 Are you afraid that something bad is going to happen to you?	Yes / No
7 Do you feel happy most of the time?	Yes / No
8 Do you often feel helpless?	Yes / No
9 Do you prefer to stay at home, rather than going out and doing new things?	Yes / No
10 Do you feel you have more problems with memory than most?	Yes / No
11 Do you think it is wonderful to be alive now?	Yes / No
12 Do you feel pretty worthless the way you are now?	Yes / No
13 Do you feel full of energy?	Yes / No
14 Do you feel that your situation is hopeless?	Yes / No
15 Do you think that most people are better off than you are?	Yes / No

APPENDIX H

The Self-Efficacy Scale (SES)

Date: _____

Client ID: _____

The Self-Efficacy Scale (SES)

Instructions: This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or feeling. Please be very truthful and describe yourself as you really are, not as you would like to be.

Mark: A If you **Disagree Strongly** with the statement
B If you **Disagree Moderately** with the statement
C If you **Neither Agree nor Disagree** with the statement
D If you **Agree Moderately** with the statement
E If you **Agree Strongly** with the statement

A	B	C	D	E
Strongly Disagree	Moderately Disagree	Neither Agree nor Disagree	Moderately Agree	Strongly Agree

1. I like to grow houseplants. _____
2. When I make plans, I am certain I can make them work. _____
3. One of my problems is that I cannot get down to work when I should. _____
4. If I can't do a job the first time, I keep trying until I can. _____
5. Heredity plays the major role in determining one's personality. _____
6. It is difficult for me to make new friends. _____
7. When I set important goals for myself, I rarely achieve them. _____
8. I give up on things before completing them. _____
9. I like to cook. _____
10. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me. _____
11. I avoid facing difficulties. _____
12. If something looks too complicated, I will not even bother to try it. _____
13. There is some good in everybody. _____

Please Turn Over

A	B	C	D	E
Strongly Disagree	Moderately Disagree	Neither Agree nor Disagree	Moderately Agree	Strongly Agree

14. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to makes friends with that person. _____
15. When I have something unpleasant to do, I stick with it until I finish it. _____
16. When I decide to do something, I go right to work on it. _____
17. I like science. _____
18. When trying to learn something new, I soon give up if I am not initially successful. _____
19. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily. _____
20. When unexpected problems occur, I don't handle them well. _____
21. If I were an artist, I would like to draw children. _____
22. I avoid trying to learn new things when they look too difficult to me. _____
23. Failure just makes me try harder. _____
24. I do not handle myself well in social gatherings. _____
25. I very much like to ride horses. _____
26. I feel insecure about my ability to do things. _____
27. I am a self-reliant person. _____
28. I have acquired my friends through my personal abilities at making friends. _____
29. I give up easily. _____
30. I do not seem capable of dealing with most problems that come up in my life. _____

APPENDIX I

The Anxiety Control Questionnaire (ACQ)

Date: _____
Client ID: _____

The Anxiety Control Questionnaire (ACQ)

Listed below are a number of statements describing a set of beliefs. Please read each statement carefully and, on the 0-5 scale given, indicate how much you think each statement is typical of *you*.

0	1	2	3	4	5
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

1. I am usually able to avoid threat quite easily. _____
2. How well I cope with difficult situations depends on whether I have outside help. _____
3. When I am put under stress, I am likely to lose control. _____
4. I can usually stop my anxiety from showing. _____
5. When I am frightened by something, there is generally nothing I can do. _____
6. My emotions seem to have a life of their own. _____
7. There is little I can do to influence people's judgements of me. _____
8. Whether I can successfully escape a frightening situation is always a matter of chance with me. _____
9. I often shake uncontrollably. _____
10. I can usually put worrisome thoughts out of my mind easily. _____
11. When I am in a stressful situation, I am unable to stop myself from breathing too hard. _____
12. I can usually influence the degree to which a situation is potentially threatening to me. _____
13. I am able to control my level of anxiety. _____
14. There is little I can do to change frightening events. _____

Please Turn Over

0	1	2	3	4	5
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

15. The extent to which a difficult situation resolves itself has nothing to do with my actions. _____
16. If something is going to hurt me, it will happen no matter what I do. _____
17. I can usually relax when I want. _____
18. When I am under stress, I am not always sure how I will react. _____
19. I can usually make sure people like me if I work at it. _____
20. Most events that make me anxious are outside my control. _____
21. I always know exactly how I will react to difficult situations. _____
22. I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms. _____
23. What people think of me is largely outside my control. _____
24. I usually find it hard to deal with difficult problems. _____
25. When I hear that someone has a serious illness, I worry that I am next. _____
26. When I am anxious, I find it difficult to focus on anything other than my anxiety. _____
27. I am able to cope as effectively with unexpected anxiety as I am with anxiety that I expect to occur. _____
28. I sometime think, " Why even bother to try cope with my anxiety when nothing I do seems to affect how frequently or intensely I experience it?" _____
29. I often have the ability to get along with "difficult" people. _____
30. I will avoid conflict due to my inability to successfully resolve it. _____

APPENDIX J

The Negative Life Events Questionnaire

General interview information

The following details need to be filled in by the interviewer.

1. **Date and duration of interview**

First session:

Date _____ Commencement time_____ Finishing Time _____

Second session:

Date _____ Commencement time _____ Finishing time _____

2. **Special observations and remarks (e.g reason why the interview was not completed):**

The interview booklet needs to be filled in by the interviewer. Each question is preceded by brief instructions.

There are two types of text in the booklet:

1. cursive text: this text contains information for the interviewer and should NOT be read out;
2. normal text: this text contains the information for the respondent and needs to be read out by the interviewer.

Answer options:

The interviewer is required to enter the answers of the respondent into the booklet. This needs to be done in the following manner:

- **When there are dotted lines after a question which do not lead to answer categories, the answer of the respondent is to be filled in on the dotted line.**
- **When there are answer categories with numbers: circle the relevant number.**
- **When there are answer categories with a square or circle before it, place a tick in the relevant square or circle.**
- **When there are answer categories without numbers, squares or circles, circle the relevant word.**
- **For some questions, the respondent is required to choose from a number of answer categories. These are printed in the questionnaire booklet. Place the options in front of the respondent. If possible and preferable, let the respondent read or look into the interview booklet, and complete the questions together.**

Check with the respondent if they are getting tired or need a break. If so, have a short break, or schedule another appointment in which to complete the interview. Allow for emotional reactions.

Life experiences

The following questions are about events which you may have experienced in life.

The questions have been sub-divided into the following categories: parents, brothers and sisters, partners, children, other important people in your life, about yourself, other events, and war-experiences.

For each question, you are also asked to indicate the period in your life during which particular events were experienced.

These periods can be classified as follows:

- **Childhood (from 0 to age 15)**
- **Early and middle adulthood (from age 16 to age 49)**
- **Late life (from age 50 onwards)**
- **In the last 12 months (the year prior to treatment)**

They appear on the chart. Place the chart with the age-categories in front of the responder.?

Questions may be answered yes or no. Some questions have multilpe choice answers. *When scoring from the list make a choice for EACH category and circle it.*

Category 1: PARENTS

1. Who were you brought up by *(you may tick more than one)*

O Biological mother			
O Biological father			
O Biological parents		**entire youth**	**> 1 situation***
O Others, e.g.	**O Family members**	O	O
	O Step-parents	O	O
	O Adoptive-parents	O	O
	O Acquaintances	O	O
	O Foster home	O	O
	O Other	O	O

**Instructions for >1 'situation'*

Check whether the respondent was brought up for his/her whole youth by the same person(s), or whether there were more situations in the same category. For example: was the respondent brought up for his/her whole youth by adoptive-parent(s), or did the respondent live in various adoption families when growing up; was the respondent brought up in 1 foster home, or were they placed in more than one home?

If the respondent was NOT brought up by the biological parents, then read 'carers' instead of 'parents' for the following questions.

	Childhood (0-15)	**Early and middle adulthood (ages 16-49)**	**Late – life (age 50 and onwards)**	**In the last 12 months**
2. Is your biological father deceased?	Yes No	Yes No	Yes No	Yes No
If yes, what was the cause? O suicide O murder O accident O natural causes O unknown **O other, namely.....**	N/A	N/A	N/A	N/A
3. Is your biological mother deceased?	Yes No	Yes No	Yes No	Yes No
If yes: what was the cause? O suicide O murder O accident O natural causes O unknown O other, namely.....	N/A	N/A	N/A	N/A

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
*3a *This question is to be answered only if not (solely) brought up by biological parent(s):* **Are any of the people who brought you up deceased?** If yes: what was the cause? *(can tick more than one)* O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A Whom _____ _____ _____ _____ _____ _____	Yes No N/A Whom _____ _____ _____ _____ _____ _____	Yes No N/A Whom _____ _____ _____ _____ _____ _____	Yes No N/A Whom _____ _____ _____ _____ _____ _____
4. Have either of your parents been away from home for a year or more when you were a child?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
5. Did your parents ever have serious financial problems?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
6. Did your parents ever have serious relationship problems?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
7. Have your parents been divorced OR separated ?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
8. Have either of your parents ever suffered from a chronic or life-threatening physical illness?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
9. Have either of your parents been addicted to alcohol, drugs, medications, or gambling, for a year or more?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
10. Have either of your parents ever been admitted to a psychiatric clinic?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
11. Have either of your parents ever attempted to commit suicide, without fatal consequences?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
12. Have either of your parents ever been convicted of a criminal offence or sentenced to prison?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
13. Have you ever had to bring up your (half/step) brothers and sisters whilst you were growing up?	Yes No N/A	Yes No N/A		
14. Were you often left to your own devices by your parent/s, and thus feel that you did not receive enough care and attention when growing up?	Yes No N/A	Yes No N/A		
15. Have you ever been humiliated or tormented by (one of) your parent/s?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
16. Were you ever seriously disciplined by either of your parents?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
17. Have you ever had sexual intercourse with (one of) your parent(s)?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
18. Have you ever had sexual contact with (one of) your parents, such as touching or showing of sexual body parts (other than sexual intercourse)?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
19. Have you ever had such a bad relationship with either of your parents that you felt a great deal of ill will towards him or her?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
20. Have there been other negative events in connection with your parents (or upbringers) which have not yet been mentioned here? 1. _____ _____ 2. _____ _____	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A

Category 2: BROTHERS and SISTERS

Do you have (half/step) brothers or sisters, or have you had them? Yes No

If No: would you have liked to have them? Yes No

(If the client does not have brothers or sisters, Go to the PARTNERS category)

In the questions below, the wording brothers and sisters also includes half and/or step brothers and sisters

How many brothers and sisters do you have (have you had)?

_____

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
21. Are any of your brother/s or sister/s deceased? If yes: what was the cause? *(complete for all siblings)* O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A Whom	Yes No N/A Whom	Yes No N/A Whom	Yes No N/A Whom
22. Have any of your brothers or sisters ever suffered from a chronic or life-threatening physical illness?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
23. Have any of your brother/s or sister/s been addicted to alcohol, drugs, medicines, or gambling for a year or more?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
24. Have any of your brother/s or sister/s ever been admitted to a psychiatric clinic?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
25. Have any of your brothers or sisters ever made an attempt to commit suicide, without fatal consequences?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
26. Have you ever been humiliated or tormented by (one of) your bother/s or sister/s over a long period?	No Yes N/A	No Yes N/A	No Yes N/A	No Yes N/A

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
27. Have you ever been seriously wounded or disciplined by any of your brothers or sisters?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
28. Have you ever had sexual intercourse with (one of) your brother/s or sister/s against your will?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
29. Have you ever had sexual contact with (one of) your brother/s or sister/s such as touching or showing of sexual parts of the body, against your will?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
30. Have you ever had such a bad relationship with any of your brothers or sisters that you felt ill will toward him or her?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
31. Have there been other negative events in connection with your brother/s or sister/s which have not been mentioned as yet? (details below) 1.	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
2.	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A

category 3: PARTNERS

Are you, or have you been in a long-term relationship, i.e. are you married, have you lived with someone for a minimum of 3 months, or have you had a long-term relationship in the past?

Yes No

If no: would you like to have a partner? Yes No

If you have not been in a long term relationship, go to the CHILDREN category

How many long-term relationships have you had? .....

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
32. Has your partner (or a previous partner) passed away during your relationship? If so: what was the cause? (can give more than one reason) O suicide O murder O accident O natural causes O unknown O other, namely.....		Yes No N/A Whom	Yes No N/A Whom	Yes No N/A Whom
33. Have either yourself and (one of) your partner/s ever had serious financial problems?		Yes No N/A	Yes No N/A	Yes No N/A
34. Have you and (one of) your partner/s ever had serious relationship problems?		Yes No N/A	Yes No N/A	Yes No N/A
35. Have you been or are you divorced or separated from (one of) your partner/s?		Yes No N/A	Yes No N/A	Yes No N/A
36. Does or did (one of) your partner/s suffer from a form of dementia?		Yes No N/A	Yes No N/A	Yes No N/A
37. Does or did (one of) your partner/s suffer from a chronic or life-threatening physical illness (excluding dementia)?		Yes No N/A	Yes No N/A	Yes No N/A

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
38. Has (one of) your partner/s been addicted to alcohol, drugs, medications, or gambling for a year or more?		Yes No N/A	Yes No N/A	Yes No N/A
39. Has (one of) your partner/s ever been admitted to a psychiatric clinic (during your relationship)?		Yes No N/A	Yes No N/A	Yes No N/A
40. Has (one of) your partner/s ever tried to commit suicide, without fatal results?		Yes No N/A	Yes No N/A	Yes No N/A
41. Has (one of) your partner/s over been convicted of a crime or sentenced to a prison term (during your relationship)?		Yes No N/A	Yes No N/A	Yes No N/A
42. Has (one of) your partner/s ever worked against you in reaching your goals?		Yes No N/A	Yes No N/A	Yes No N/A
43. Have you and (one of) your partner/s had problems in having your own children?		Yes No N/A	Yes No N/A	Yes No N/A
44. Have you ever had sexual problems with (one of) your partner/s, such as not enjoying sex or problems with petting?		Yes No N/A	Yes No N/A	Yes No N/A
45. Has (one of) your partner/s ever cheated one you with someone else?		Yes No N/A	Yes No N/A	Yes No N/A
46. Have you ever been humiliated or tormented by (one of) your partner/s over a long period of time?		Yes No N/A	Yes No N/A	Yes No N/A
47. Have you ever been deliberately wounded or diciplined by (one of) your partner/s?		Yes No N/A	Yes No N/A	Yes No N/A
48. *Have you ever had sexual intercourse with (one of) your partner/s against your will?		Yes No N/A	Yes No N/A	Yes No N/A
49. *Have you ever had sexual contact against your will with (one of) your partner/s (different from sexual intercourse)?		Yes No N/A	Yes No N/A	Yes No N/A

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
50. Has (one of) your partner/s ever forced you into prostitution?		Yes No N/A	Yes No N/A	Yes No N/A
51. Have there been any other negative events in relation to your partner/s which have not as yet been mentioned? 1. .... 2.		Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A

** Rather, say, " Have you ever engaged in any activities at the request of your partner against your will" in place of questions 48 and 49*

category 4: CHILDREN

Have you had children? YES NO
If no, Go to category OTHER PERSONS WHO ARE IMPORTANT FOR YOU

How many children do you have or have you had?.....

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
52. Have any of your children passed away? If yes: what was the cause/s O Suicide O Murder O accident O Natural causes O unknown O Other, namely	Yes No N/A Whom _____ _____ _____ _____ _____ _____ _____	Yes No N/A Whom _____ _____ _____ _____ _____ _____ _____	Yes No N/A Whom _____ _____ _____ _____ _____ _____ _____	Yes No N/A Whom _____ _____ _____ _____ _____ _____ _____

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
53. Have you ever had serious problems with bringing up your child(ren)?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
54. Has someone else ever taken over the upbringing of your children?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
55. Has the relationship with (one of) your child(ren) been broken?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
56. Is (one of) your child(ren) divorced or separated?		Yes No N/A	Yes No N/A	Yes No N/A
57. Did (one of) your child(ren) suffer from a chronic or life-threatening physical illness?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
58. Has (one of) your child(ren) been addicted to alcohol, drugs, medication, or gambling for a year or more?		Yes No N/A	Yes No N/A	Yes No N/A
59. Has (one of) your child(ren) ever been admitted to a psychiatric clinic?		Yes No N/A	Yes No N/A	Yes No N/A
60. Has (one of) your child(ren) ever tried to commit suicide, without fatal results?		Yes No N/A	Yes No N/A	Yes No N/A
61. Has (one of) your child(ren) ever been convicted of a criminal offence or sentenced to a prison term?		Yes No N/A	Yes No N/A	Yes No N/A
62. Have there been any other negative events with relation to your child(ren) which have not been mentioned as yet? 1. .... 2.	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A

Category 5: OTHER PEOPLE WHO ARE IMPORTANT TO YOU

The questions below are about other people who are important to you. This can include people such as friends, grand-children, family-in-law, confidants, a mentor or exemplar (e.g a priest, or pastor) or anyone who is or was important to you.

	Childhood (0-15)	**Early and middle adulthood (ages 16-49)**	**Late – life (age 50 and onwards)**	**In the last 12 months**
63. Have you ever had a bad relationship with someone who was important to you, over an extended period of time?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
64. Is someone who was important to you now deceased? Yes/No If yes, whom? *(can tick more than one).* O *grand-child* **What was the cause?** O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
O *family (in-law)* **What was the cause?** O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
O *friend/acquaintance* **What was the cause?** O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A

O *confidant* **What was the cause?** O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
O *mentor/examplar* **What was the cause?** O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
Others, namely..... **What was the cause?** O suicide O murder O accident O natural causes O unknown O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
65. Have you ever been humiliated or tormented for a considerable period by someone who was important to you?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
66. Have you ever been deliberately wounded or disciplined by someone who was important to you?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
67. Have there been other negative events with relations to important people which have not been mentioned as yet? (List below) 1. .... 2.	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A

Category 6: YOURSELF

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
68. During your childhood were you ever teased, excluded or ignored by other children?	Yes No N/A			
69. Did you go to boarding school and board	Yes No N/A	Yes No N/A		
70. Do you have a chronic or life-threatening physical illness?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
71. Have you ever had to remain in hospital or at home for a long time, (i.e. 3 months or longer), due to a physical illness?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
72. Have you ever been addicted to alcohol, drugs, medications, or gambling?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
73. Have you ever been admitted to a psychiatric clinic?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
74. Have you ever been convicted of a crime or sentenced to a prison term?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
75. Have you ever been discriminated against? If yes: what was the reason? O race O belief O sex/gender O sexual preference O age O other, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
76. Have you ever had concerns about your sexual orientation?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A

77. Have you ever had concerns about your religious beliefs? If yes: in what way? _____ _____	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
78. Have you ever had serious financial problems?		Yes No N/A	Yes No N/A	Yes No N/A
79. Have you ever been unemployed against your will for an extended period of time, e.g. 6 months or longer?		Yes No N/A	Yes No N/A	Yes No N/A
80. Have you ever experienced a loss of people, a nice place to live, or of customs, due to moving to a new place of abode?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
81. Have you ever experienced a violent crime?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
82. Have you ever nursed someone for a longer period, e.g. 3 months or more (not professionally)?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
83. Have you or your partner ever had a miscarriage or still-born child?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
84. Have you or your partner ever had an abortion?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A

Category 7: OTHER EVENTS

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
85. Have you ever experienced a crisis, such as: O direct involvement with a fire. O major flood O storm/tempest O other natural disaster (earthquake, vulcanic eruption) O car or train accident O bomb attack (NOT during war) O other, namely.....	Yes No Yes No Yes No Yes No Yes No Yes No	Yes No Yes No Yes No Yes No Yes No Yes No	Yes No Yes No Yes No Yes No Yes No Yes No	Yes No Yes No Yes No Yes No Yes No Yes No
86. Has anyone ever made threatening sexual remarks to you? If yes: who? O Upbringer(s) O brother(s)/sister(s) O other family members O acquaintance(s) O others, namely.....	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
87. Have you ever engaged in any activity or been asked to do something by someone known to you (who has not yet been mentioned), against your will?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
88. Have you ever, against your will, had sexual contact with a stranger, such as touching or showing of sexual parts of the body (other than sexual intercourse)?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
89. Are there any other negative experiences which have not yet been mentioned? 1. .... 2.	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A

Category 8 : WAR EXPERIENCES

Have you ever personally experienced war?
If no: This is the end of this section.

If yes: which one? *(Can fill in more than one)*

O WW1 (1914-1918)
O WW2 (1940-1945)
O Indonesian war of independence (1945-1950)
O Vietnam War
O Others, namely.....

Did you experience the following events personally during a war (in war-or battle situations?)

	Childhood (0-15)	Early and middle adulthood (ages 16-49)	Late – life (age 50 and onwards)	In the last 12 months
90. Served as a military volunteer, in a military service call up, or as a military professional	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
91. Violent activities experienced in immediate surroundings	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
92. Loss of friends or family members	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
93. Seriously wounded, permanently disabled or contracted illness	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
94. Personally being tortured	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
95. Your life was in danger	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
96. Serious hunger problems	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
97. Experienced bombardments	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
98. You personally needed to go underground if yes: what was the reason for that?	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A

O escape from forced labour O Jewish underground O resistance activities O other, namely.....				
99. Experienced forced evacuation	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
100. Home or living environment destroyed	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
101. Interned or imprisoned	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
102. Placed on transport (note: to concentration camps)	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
103. Forced labour	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
104. Worked for the resistance movement	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
105. Accused of collaboration. If yes: this was: O true O untrue	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
106. Personally killed someone	Yes No N/A	Yes No N/A	Yes No N/A	Yes No N/A
107. Are there any other negative experiences relating to the war which have not been mentioned before? 1. .... 2.	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A	Yes No N/A Yes No N/A

This is the end of this section.

APPENDIX K

Participant Information Sheet

Early and late-onset anxiety in older adults: Implications for the clinical presentation and management of anxiety in late-life.

CLIENT INFORMATION SHEET

The purpose of this study is to gain a better understanding of anxiety and worry in adults over 55 and the life events that may contribute to the development of these concerns. The study also aims to look at whether the impact of various life events and the concerns of people over 55 differ between individuals who feel anxious, and those who do not. Finally, the study aims to determine whether particular components of treatment are more effective in managing anxiety, and whether a person's response to treatment depends on when the anxiety problem began.

The study will be conducted in two stages. If you choose to participate in this study, the first stage will involve attending an interview and answering some questions about yourself, your family, your medical history, and your experiences of anxiety and depression. With your permission, the investigator will also communicate with your general practitioner with regards to your physical health and medication use. This interview will also include the measurement of your blood pressure and skin conductance, and the measurement of your height and weight. You will also be required to fill out some questionnaires asking you to consider various statements about how you've been feeling lately, and how you feel in response to various situations. These may be completed in your own time and returned to the researcher in a stamped, self-addressed envelope provided. Alternatively, we can assist with the completion of the questionnaire if this is preferable. The package of questionnaires will take about 45 minutes to complete, and the interview is expected to take up to three hours with breaks as required.

Should you be considered suitable, in the second stage of the study you will be invited to participate in a 12-week cognitive-behavioural (CBT) treatment programme, which will offer, personalised attention for your anxiety and worry problems. Throughout the treatment programme, as in the first study, you will be required to complete questionnaires asking you to consider your symptoms of anxiety and depression, and to provide ratings of various components of treatment. For supervision purposes, interviews and treatment sessions may be audio and/or videotaped. Taping of these sessions will only be undertaken after consultation with you.

Your participation in this study is voluntary and greatly appreciated. You are free to withdraw from this study at any time and for any reason without explanation, and your withdrawal will not affect treatment provided by the ANU psychology clinic or any other treatment provider. Your participation is also confidential. All questionnaires and

information we collect will be kept in a locked cabinet, which can only be accessed by the researcher. Moreover, the questionnaires and information will be coded so that you cannot be identified. The research will contribute to a PhD thesis and potentially a journal article. Information about the project will not be made public in any way that identifies individual participants.

If you choose to participate, you are required to complete an informed consent form indicating that you do wish to participate in this research and are doing so voluntarily. If, after reading this information you wish to participate in this research please sign the informed consent form.

If you have any questions regarding any of the information in this sheet or about the research in general, please do not hesitate to contact either of the following researchers

Ms. Maaria Haque
School of Psychology
Building 39
The Australian National University
Canberra ACT 0200

Ph: (02) 6125 3972
Fax: (02) 6125 0499
Email: Maaria.Haque@anu.edu.au

Dr. Richard O'Kearney
School of Psychology
Building 39
The Australian National University
Canberra ACT 0200

Ph: (02) 6125 8158
Fax: (02) 6125 0499
Email: Richard.Okearney@anu.edu.au

Dr. Mike Bird
Southern Area Mental Health
Queanbeyan NSW 2620
Ph (02) 6124 9874
Email: Mike.Bird@sahs.nsw.gov.au

If you have any concerns regarding the way the research was conducted, please contact the ANU Human Research Ethics Committee:

Human Ethics Officer
Human Research Ethics Committee
The Australian National University
Canberra ACT 0200
Ph: (02) 6125 7945
Email: Human.Ethics.Officer@anu.edu.au

APPENDIX L

Participant Consent Form

RESEARCH CONSENT FORM

I, _____
(name of participant)

of _____ _____ _____
(street) (Suburb/town) (state & postcode)

have been asked to consent to my participation in a research project entitled:

Early and late-onset anxiety disorders in older adults: Implications for the clinical presentation and management of anxiety in late-life.

I have read the information sheet for this study and understand its contents, and have been informed of the following points:

1. The aim of this project is to gain a better understanding of the experience of anxiety and the life events that contribute to the development of these concerns in adults aged 55 and above; and to investigate responsiveness to components of a treatment program for anxiety, according to the age at which individuals began experiencing anxiety.

2. The results obtained from the study may or may not be of direct benefit to my mental health management and treatment.

3. a) Participation in the research project will involve attending an interview in which I will be asked questions about myself, my family, my medical history, and my experience of past and current anxiety problems. This interview will take up to 2 hours with breaks where needed;
   b) I understand that the initial interview will also involve the researcher taking measurements of my skin conductance, blood pressure, and my height and weight; and
   c) I understand that I will be asked to complete a questionnaire package as part of the interview, which will involve answering questions about my feelings of anxiety, worry, and depression, and how I respond to various situations. This is expected to take approximately 45 minutes to complete.

4. I understand that I may also be invited to take part in a treatment program, which will involve attending individual treatment sessions over a 12-week period and that between treatment components I will be asked to complete some of the questionnaires completed in the first stage of the study, as well a questionnaire asking me to rate my experiences of the treatment and its effectiveness.

5. I give permission to the researcher to audio and or videotape the interview and treatment sessions.

6. I give permission to the researcher to contact my G.P during the course of my involvement in the research project, in order to gather information about my physical health status and medication use.

7. I understand that while the results of the research may be published in the form of a PhD thesis and/or a journal article, my involvement and my identity will not be revealed in any way.

8. I understand that the information provided by me will be kept confidential so far as the law permits. This form and the questionnaires will be stored separately in a locked office at the Australian National University. Data entered onto a computer will be kept in a computer accessible only by password by the researcher

9. I understand that I may withdraw form the research project at any stage, and that this will not affect my mental health care in any way, now or in the future.

10. Should I have any concerns regarding participation, I am aware that I may contact:

Ms. Maaria Haque
School of Psychology
Building 39
The Australian National University
Canberra ACT 0200

Ph: (02) 6125 3972
Fax: (02) 6125 0499
Email: Maaria.Haque@anu.edu.au

Dr. Richard O'Kearney
School of Psychology
Building 39
The Australian National University
Canberra ACT 0200

Ph: (02) 6125 8158
Fax: (02) 6125 0499
Email: Richard.Okearney@anu.edu.au

11. Should I have any other problems or queries about the way in which the study was conducted, and I do not feel comfortable contacting the research staff, I am aware that I may contact:

Human Ethics Officer
Human Research Ethics Committee
The Australian National University
Canberra ACT 0200
Ph: (02) 6125 7945
Email: Human.Ethics.Officer@anu.edu.au

After considering all these points, I accept the invitation to participate in this project.

Signature (of Participant): _____ Date: _____

Signature (of Investigator): _____ Date: _____

APPENDIX M

Inter-rater Reliability Rating Form

Date:
Client ID number:

Clinician's Ratings and Diagnoses

Date of birth:

Date of initial assessment:

Age at initial assessment:

Age (or year of onset) of presenting problem: _____

Current DSM-IV Diagnoses

AXIS I

1. _____
2. _____
3. _____
4. _____

AXIS II	AXIS III
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

AXIS IV Recent Significant Life Events

Problems with primary support (specify) _____

_____

Problems related to the social environment (Specify) _____

_____

Educational problems (Specify) _____

_____

Economic problems (Specify) _____

_____

Problems with access to health care services (Specify) _____

_____

Problems related to interaction with the legal system/ crime (Specify) _____

_____

Other psychosocial and environmental problems (Specify) _____

_____

Past DSM-IV Diagnoses

Diagnosis	**Date of Onset** (Or age of client, number of years ago)	**Date of Remission**
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Things to listen for:

- Report of the client's first subjective experience of significant anxiety (i.e., first onset, be it in terms of chronological age, or year). If client is vague with regards to date of onset, attempt to ascertain by linking onset to objective life events reported (e.g, death of a family member, birth of a child…). These details may come up throughout the interview rather than at the time the client is initially asked about onset (i.e., when talking about vocation, marital history etc).

- Report of client's first help-seeking or when they first got help for emotional difficulty – this may be psychological or medical (i.e., report of taking antidepressant or anxiolytic medication, being treated by a prescription from a G.P, psychiatrist, or if they have previously sought psychological help). If client does not report an age of onset or year, but reports when they got help, this may be seen as their first significant episode. [There may be differences as clients may report anxiety was a problem as an adolescent, but were first treated for post-natal depression, in this instance the clients report of first experience takes precedent].

- Some participants may not have a current episode/presenting problem, but will describe a significant episode or episodes in the past.

- Some participants refer to having a 'panic attack' or 'anxiety attack', though what they are describing is intense worry and anxiety that does not include symptoms of an actual panic attack, and use this to describe worry that is more consistent with GAD.

APPENDIX N

Treatment Evaluation Forms
(Following each treatment module and at six-month follow-up)

Date:

Client ID:

Having learnt controlled breathing and relaxation techniques, use the following scale to answer the following questions about your experience of anxiety:

0----------1----------2----------3----------4----------5----------6----------7----------8

None/ Not at all | Mild | Moderate | Severe | Very Severe/ Very much

1. Since learning and using these skills, how much do you experience?

	Rating
a. Irritability	_____
b. Restlessness, feeling keyed up or on edge	_____
c. Being easily fatigued	_____
d. Difficulty concentrating or mid going blank,	_____
e. Muscle tension, and	_____
f. Difficulty falling asleep/ staying asleep; Restless /unsatisfying sleep	_____

Use the same scale to answer questions 2-6:

2. How would you rate your overall level of/experience of anxiety? _____

3. How much are you bothered by your worrying thoughts? _____

4. To what degree do you believe that your worries or anticipated negative events will occur? _____

5. How long, or how much of the day do you spend worrying? _____

6. Have these skills led to, or helped reduce the *frequency* of anxiety episodes you experience per week? Y N

7. Has learning these skills led to, or helped reduce the *intensity* of anxiety you experience? Y N

8. Has learning these skills helped with your worries, and anticipation of worrisome events occurring? Y N

Use the following rating scale to answer the following questions (9-14):

0---------1---------2---------3---------4---------5---------6---------7---------8

None Very little	Some/ A little	Moderate/ Quite a bit	Much/ A lot	Very Much/

9. How useful do you find these strategies in managing your anxiety? _____

10. What impact has learning and implementing these strategies had on your anxiety and how you feel? _____

11. What impact have these skills had on your sleep patterns (e.g., amount and quality of sleep)? _____

12. To what extent has your ability to manage anxiety changed as a result of learning these skills? _____

13. How confident are you that these skills will be successful in managing your anxiety? _____

14. To what degree have these skills helped in managing your anxiety? _____

15. How would you rate your ability to cope with your anxiety/worry?
(Please circle)

1----------2----------3----------4----------5

Poor Fair Good Very Good Excellent

Further comments

_____

_____

Date:

Client ID:

Having learnt cognitive skills such as thought monitoring, identifying thinking errors and applying alternative beliefs; use the following scale to answer the following questions about your experience of anxiety:

0----------1----------2----------3----------4----------5----------6----------7----------8

None/ Not at all | Mild | Moderate | Severe | Very Severe/ Very much

1. Since learning and using these skills, how much do you experience?

	Rating
a. Irritability	_____
b. Restlessness, feeling keyed up or on edge	_____
c. Being easily fatigued	_____
d. Difficulty concentrating or mid going blank,	_____
e. Muscle tension, and	_____
f. Difficulty falling asleep/ staying asleep; Restless /unsatisfying sleep	_____

Use the same scale to answer questions 2-6:

2. How would you rate your overall level of/experience of anxiety? _____
3. How much are you bothered by your worrying thoughts? _____
4. To what degree do you believe that your worries or anticipated negative events will occur? _____
5. How long, or how much of the day do you spend worrying? _____
6. Have these skills led to, or helped reduce the *frequency* of anxiety episodes you experience per week? Y N

7. Has learning these skills led to, or helped reduce the *intensity* of anxiety you experience? Y N

8. Has learning these skills helped with your worries, and anticipation of worrisome events occurring? Y N

Use the following rating scale to answer the following questions (9-14):

0----------1----------2----------3----------4----------5----------6----------7----------8

None Very little	Some/ A little	Moderate/ Quite a bit	Much/	Very Much/ A lot

9. How useful do you find these strategies in managing your anxiety? _____

10. What impact has learning and implementing these strategies had on your anxiety and how you feel? _____

11. What impact have these skills had on your sleep patterns (e.g., amount and quality of sleep)? _____

12. To what extent has your ability to manage anxiety changed as a result of learning these skills? _____

13. How confident are you that these skills will be successful in managing your anxiety? _____

14. To what degree have these skills helped in managing your anxiety? ___

15. How would you rate your ability to cope with your anxiety/worry?

(Please circle)

1----------2----------3----------4----------5

Poor Fair Good Very Good Excellent

Date:

Client ID:

Having learnt behavioural skills, including establishment of daily structure and gradual exposure to worrisome or avoided events, use the following scale to answer the following questions about your experience of anxiety:

0---------1---------2---------3---------4---------5---------6---------7---------8

None/ Not at all | Mild | Moderate | Severe | Very Severe/ Very much

1. Since learning and using these skills, how much do you experience?

	Rating
a. Irritability	_____
b. Restlessness, feeling keyed up or on edge	_____
c. Being easily fatigued	_____
d. Difficulty concentrating or mid going blank,	_____
e. Muscle tension, and	_____
f. Difficulty falling asleep/ staying asleep; Restless /unsatisfying sleep	_____

Use the same scale to answer questions 2-6:

2. How would you rate your overall level of/experience of anxiety? _____
3. How much are you bothered by your worrying thoughts? _____
4. To what degree do you believe that your worries or anticipated negative events will occur? _____
5. How long, or how much of the day do you spend worrying? _____
6. Have these skills led to, or helped reduce the *frequency* of anxiety episodes you experience per week? Y N

7. Has learning these skills led to, or helped reduce the *intensity* of anxiety you experience? Y N

8. Has learning these skills helped with your worries, and anticipation of worrisome events occurring? Y N

Use the following rating scale to answer the following questions (9-14):

0----------1----------2----------3----------4----------5----------6----------7----------8

None Very little	Some/ A little	Moderate/ Quite a bit	Much/	Very Much A lot

9. How useful do you find these strategies in managing your anxiety? _____

10. What impact has learning and implementing these strategies had on your anxiety and how you feel? _____

11. What impact have these skills had on your sleep patterns (e.g., amount and quality of sleep)? _____

12. To what extent has your ability to manage anxiety changed as a result of learning these skills? _____

13. How confident are you that these skills will be successful in managing your anxiety? _____

14. To what degree have these skills helped in managing your anxiety? _____

15. How would you rate your ability to cope with your anxiety/worry?
(Please circle)

1----------2----------3----------4----------5

Poor Fair Good Very Good Excellent

Date:

Client ID:

Having participated in the study, please use the following scale to answer the following questions about your current experience of anxiety:

0----------1----------2----------3----------4----------5----------6----------7----------8

None/ Not at all | Mild | Moderate | Severe | Very Severe/ Very much

1. Since your participation in the study, and have learnt techniques to manage anxiety, how much do you experience?

	Rating
a. Irritability	_____
b. Restlessness, feeling keyed up or on edge	_____
c. Being easily fatigued	_____
d. Difficulty concentrating or mid going blank,	_____
e. Muscle tension, and	_____
f. Difficulty falling asleep/ staying asleep; Restless /unsatisfying sleep	_____

Use the same scale to answer questions 2-6:

2. How would you rate your overall level of/experience of anxiety? _____
3. How much are you bothered by your worrying thoughts? _____
4. To what degree do you believe that your worries or anticipated negative events will occur? _____
5. How long, or how much of the day do you spend worrying? _____

6. Has the program, and the skills learnt through your participation led to, or helped reduce the *frequency* of anxiety episodes you experience per week? Y N

7. Has participation and learning of these skills led to, or helped reduce the *intensity* of anxiety you experience? Y N

8. Has participation in the program and learning of these skills helped with your worries and anticipation of worrisome events occurring? Y N

Use the following rating scale to answer the following questions (9-14):

0----------1----------2----------3----------4----------5----------6----------7----------8

None Very little	Some/ A little	Moderate/	Much/ Quite a bit	Very Much/ A lot

9. How useful do you find the strategies learnt in managing your anxiety? _____

10. What impact has participation in the study, and implementing the strategies learnt through the program, had on your anxiety and how you feel? _____

11. What impact has participation in the program and the skills learnt had on your sleep patterns (e.g., amount and quality of sleep)? _____

12. To what extent has your ability to manage anxiety changed as a result of participating in the program and learning skills to manage anxiety? _____

13. How confident are you that the skills have been successful in managing your anxiety? _____

14. To what degree has participation and the skills learnt helped in managing your anxiety? _____

15. How would you rate your ability to cope with your anxiety/worry?

(Please circle)

1----------2----------3----------4----------5
Poor Fair Good Very Good Excellent

16. When it comes to your health, how would you compare yourself to others your age? **(Please circle on the following scale)**

Much better off	1
Somewhat better off	2
About the same	3
Somewhat worse off	4
Much worse off	5

17. Compared to one year ago, in general, how would you rate your health now?

Much better than one year ago	1
Somewhat better than one year ago	2
About the same as one year ago	3
Somewhat worse than one year ago	4
Much worse than one year ago	5

18. To what extent did you find the programme helpful overall?

0----------2----------3----------4----------5----------6
Not at all somewhat helpful extremely helpful

19. What parts of the programme did you find useful?

_____

_____

20. What aspects of the programme have you continued to use to help manage your anxiety (e.g., breathing, relaxation, monitoring your thoughts, identifying thinking errors, looking for evidence, activity scheduling, problem solving, exposure etc)?

_____

_____

21. Which of the techniques learnt have been most useful in helping to reduce your anxiety?

_____

_____

22. Which of the techniques learnt have been most beneficial in helping you to manage your anxiety_____

_____

23. To what extent has your ability to manage anxiety changed since participating in the study?

0----------2----------3----------4----------5----------6

Got worse not at all changed a lot

Further comments

_____

_____

_____

_____

APPENDIX O

Summary and Outline of Treatment Manual

Late-Life Anxiety Study

Modular CBT Treatment Manual

Modules

Psychoeducation and Awareness Module (session 1)

(i) Overview and introduction

(ii) Explanation of tripartite model of anxiety (physiological, cognitive, and behavioral components)

(iii) Explanation of treatment principles and procedures

Relaxation Skills (sessions 2 & 3)

(i) Training in controlled breathing

(ii) Training in Progressive Deep Mu scle Relaxation (8-muscle exercise; 4-muscle exercise with discrimination training; relaxation-by-recall)

(iii) Cued relaxation

Cognitive skills (4 sessions)

Session 4

(i) Explanation of role of thinking in anxiety and other negative emotions

(ii) Instruction on self-monitoring of symptoms according to cognitive-behavioral format.

- Downward arrow technique.

Session 5

(i) Identification of logical errors/cognitive distortions (e.g., overestimating, catastrophizing, etc.) and alternative explanations

Session 6

(i) Application of alternative beliefs

Session 7

(i) Thought stopping

(ii) Sleep hygiene (including sleep restriction, stimulus control)

Behavioral Skills and skills application (5 sessions, including relapse prevention)

Session 8

(i) Establishment of daily schedule/structure

(ii) Worry behavior prevention

Sessions 9-12

(i) Problem-solving

- Generating alternative solutions, evaluating costs/benefits, implementing strategies

(ii) Exposure to avoided or anxiety-provoking situations (counter-conditioning model)

(iii) Hierarchy construction; Graduated exposure plus ongoing practice (with application of all coping skills: relaxation, cognitive, behavioral)

(iv) Relapse prevention (including summary of therapeutic principles, plans for maintaining gains, and continued practice.

Outline of treatment procedures and basic principles underlying treatment

There are four primary treatment modules in the manual.

The first module consists of basic information and psychoeducation. This module is designed to convey the nature, processes and consequences of anxiety and worry, and to correct any misconceptions held by the client about anxiety.

The second module consists of somatic control exercises in the form of progressive muscle relaxation training. Relaxation is included to directly target the physiological arousal and tension that are a core component of anxiety, particularly GAD and panic disorders. Moreover, relaxation has been demonstrated to be effective in terms of treating anxiety (Craske, Barlow & O'Leary, 1992).

Third, cognitive skills and cognitive restructuring are designed to foster the recognition and replacement of anxious, negatively skewed styles of thought. The explanation of the role of thinking and common logical errors are designed to impart on the client a sense that their way of thinking, and thus their experience of anxiety is modifiable.

The fourth module consists of behavioural skills intended to initiate and/or increase the client's activity, thus imparting a sense of control and mastery over ones activities and daily life. Problem solving is also delivered to instil a sense of manageability in regards to problems and issues that have arisen or may arise. Sleep hygiene is implemented as needed to those having problems with sleep disturbance.

Worry exposure for those with generalized anxiety is used to evoke, in a methodical and controlled fashion, the worries most salient to the individual. Repeated exposures and increasing control over the worry process focuses on replacing cognitive avoidance tendencies with of cognitive modification through approach and challenge. Further, in vivo exposure to situations that are being avoided or put off, and response prevention of any safety behaviours is included. Since over-cautiousness and safety/checking behaviour are understood to be principally motivated by the anticipation of some negative outcome or of levels of anxiety that might impair performance, cognitive restructuring and relaxation are emphasized and practiced before conducting graduated exposure exercises.

The first two treatment modules are viewed principally as skills for managing anxiety once it has been elicited. On the other hand, the worry exposure, in vivo exposure and response prevention modules are seen as the principal vehicles by which control over the initiation of the anxiety and worry processes is acquired.

Targets of treatment

The manual is aimed at addressing cognitive biases, physiological arousal and avoidance behaviours. It also introduces time management and problem solving skills to address other issues that may, in some cases, be pertinent to the experience of anxiety, such as life stressors, e.g., relationship difficulties and job loss. The manual does not attempt to directly address additional problems that can co-occur with anxiety, such as depression, however many of the same treatment techniques and skills apply so such problems, and may have transfer effects.

Individual variability

The treatment manual attempts to apply to a broad range in the extent to which an individual may experience worry, arousal and avoidance. Given individual variability, not all sections of the program will be equally relevant for every client. Some individuals may primarily experience excessive worry, whereas others primarily experience excessive arousal even though their worry is judged to be in proportion to their life circumstances. Thus, for some sufferers of chronic anxiety, the cognitive restructuring may be less relevant than the relaxation, or vice versa. Nevertheless, all modules should be delivered to the client

Differentiating panic and anxiety

The state of anxiety is differentiated from fear/panic, both theoretically and with respect to their three-response-mode presentation (cognitive, physiological and behavioural).

Anxiety is characterized by (i) perception/awareness of distant threat, (ii) chronic tension and hyperarousal, and (iii) cautiousness, procrastination and interference with performance and the ability to concentrate on the task at hand.

Fear or *panic* is characterized by (i) perception/awareness of immediate peril, (ii) sudden, automatic discharge, and (iii) strong escape or fight/flight urges.

General Optimization Strategies

To optimize compliance and attendance, and heighten the impact of CBT methods, the following strategies are utilized for all clients, at all applicable sessions, regardless of the specific module:

1. Weekly reading assignments compiled from Craske, Barlow, & O'Leary's Mastery of Your Anxiety and Worry: Client Workbook, and Padesky and Greenberger's Mind over mood- Client Manual. Each week the therapist assigns readings corresponding the specific module currently being implemented. At the following session, the therapist inquires about the reading and answers any questions the client has.

2. Following each session, a summary of essential points covered during the session, as well as the client's specific assignments for the week is given to the client. The subsequent session includes a point-by-point review of the previous session's summary sheet, including inquiry concerning the client's utilization of any cognitive or behavioral strategies described therein, as well as review of homework assignments.

APPENDIX P

Descriptive Analysis of EO and LO Participants

Appendix P presents the descriptive statistics for the age of onset, demographic, health, psychiatric treatment and comorbidity, genetic and psychological characteristics of early- and late-onset participants who took part in the treatment study (Chapter Eleven).

Appendix P.1 Age at onset characteristics

Descriptive statistics for age at evaluation and age at onset of current and past episodes of illness are presented in Table P.1. Comparison of means using independent-samples t-tests were performed to examine the differences in age at evaluation and age at onset of current and past episodes of psychiatric illness between EO and LO groups using a Bonferroni adjustment of $\alpha = 0.0125$. No differences were found between onset groups in mean age at evaluation or age at onset of presenting episode of GAD. Comparison of onset groups revealed that, on average, the EO group was significantly younger than the LO group at age of first onset of a DSM-IV disorder of any kind. Similarly, participants in the EO group were found to be significantly younger, on average, than those in the LO group at age of first onset of a DSM-IV disorder of any kind. Levene's test for equality of variances was significant for these two variables, indicating non-equal variances for groups on these two variables. Accordingly, t values, degrees of freedom, and p values reported for these variables are based on Levene's test of equality.

Table P.1

Mean Age at Evaluation and Mean Age at Onset of Current and Past Episodes of Illness for Early-and Late-Onset Participants (N = 41)

	Early Onset (N = 18)		Late Onset (N = 23)		Significance test
Variable	M	SD	M	SD	$t_{[df]}$
Age at evaluation (years)	61.33	5.52	63.13	6.43	$-0.94_{[39]}$
Age at onset of presenting episode (years)	58.67	6.54	59.70	5.55	$-0.54_{[39]}$
Age at first onset of any disorder (years)	15.33	5.59	51.13	14.15	$-11.07_{[30.11]}$***†
Age at onset of first anxiety disorder (years)	15.33	5.59	54.26	9.97	$-15.81_{[35.76]}$***†

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† equality of variances not assumed (Levene's test significant)

Appendix P.2 Demographic characteristics

Descriptive statistics were conducted to investigate the demographic characteristics of participants, and are presented in Tables P.2 and P.3. Gender, ethnicity and marital status are presented in Table P.2, with χ^2 tests revealing no significant differences between onset groups. Females outnumbered males in both EO and LO groups 2:1. The majority of participants were non-indigenous Australian and married and/or living with a partner.

Table P.2

Demographic Characteristic of Early-and Late Onset Participants (N = 41)

	Early Onset (N = 18)		*Late Onset (N =23)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	χ^2 *[df]*
Gender					$0.04_{[1]}$
Male	33.3	(6)	30.4	(7)	
Female	66.7	(12)	69.6	(16)	
Ethnicity					$0.74_{[3]}$
Non-indigenous Australian	66.7	(12)	73.9	(17)	
European	22.2	(4)	13.0	(3)	
Asian	5.6	(1)	8.7	(2)	
South American	5.6	(1)	4.3	(1)	
Marital status					$0.11_{[1]}$
Single	5.6	(1)	4.3	(1)	
Married/in a relationship	83.3	(15)	87.0	(20)	
Separated or divorced	11.2	(2)	4.3	(1)	
Widowed			4.3	(1)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

The educational and occupational characteristics of EO and LO participants are presented in Table P.3, with χ^2 tests revealing no significant differences between onset groups. Using a cut-off of 50 years to distinguish onset groups, analysis of demographic characteristics revealed a significant difference between groups for occupation, ($\chi^2(1) = 4.89$; $p < 0.05$). Inspection of the standardised residuals for this variable reveal that there was a greater number of participants in the EO group in non-professional positions than expected, and fewer LO participants in the non-professional positions than expected. There were also fewer EO participants in professional positions than was expected and a greater number of LO participants in professional positions than expected.

Table P.3

Education and Occupation Characteristics of EO and LO participants (N = 41)

	Early Onset (N = 18)		*Late Onset (N =23)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$\chi^2_{[df]}$
Level of education					$0.04_{[1]}$
Year 8 – 'intermediate'	16.7	(3)	4.3	(1)	
Year 10 – 'matriculation'	16.7	(3)	26.1	(6)	
Tafe/trade qualification	11.1	(2)	43.5	(10)	
University degree	50.0	(9)	17.4	(4)	
Post-graduate degree	5.6	(1)	8.7	(2)	
Occupation					$1.77_{[1]}$
Professional or associate	38.9	(7)	65.2	(15)	
professional	44.4	(8)	26.1	(6)	
Higher administrative or clerical	5.6	(1)			
Tradesperson	11.1	(2)	8.7	(2)	
Non-professional					
Employment status					$0.17_{[1]}$
Employed	50.0	(9)	43.5	(10)	
Unemployed	11.1	(2)	4.3	(1)	
Retired	38.9	(7)	52.2	(12)	
Employment intensity					$2.98_{[2]}$
Part-time	38.9	(7)	17.4	(4)	
Full-time	11.1	(2)	26.1	(6)	
n/a	50.9	(9)	56.5	(13)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Appendix P.3 Health characteristics

Appendix P.3.1 Current medical conditions

As a group, participants had 42 different current medical disorders. Descriptive statistics for the more commonly reported disorders are listed in Table P.4. The most common medical conditions for both EO and LO groups included a pain syndrome, arthritis, high blood pressure, high cholesterol, and irritable bowel syndrome. A high percentage of both EO and LO groups reported wearing glasses for reading and/or long-distance vision.

A series of analyses were conducted to determine whether early-and late-onset groups differed with regards to medical comorbidity. Analyses were not performed between groups for conditions where there was an expected cell count of less than five (i.e respiratory, cardiac and endocrine/metabolic conditions). Overall, EO and LO groups were found to be similar with respect to the frequency of current health conditions experienced by adults with late-life GAD, as seen in Table P.4. 2x2 χ^2 analyses revealed no significant differences between groups in terms of diseases of the nervous system, blood pressure, cholesterol, digestive and gastrointestinal conditions, musculoskeletal/ connective tissue conditions, or problems with vision. Pain was found to be more prevalent in the LO group, however this difference was not found to be significant. Overall EO and LO participants reported an average of 3.7 (S.D = 2.5) and 5.2 (S.D = 3.5) medical conditions each. An independent-samples t-test indicated that onset groups did not differ in the total number of conditions reported by EO and LO participants, on average ($t(39) = -1.49$, $p > .005$).

Table P4

Current Medical Conditions and Mean Number of Total Medical Conditions for Early- and Late-Onset Participants (N = 41)

	Early onset (N=18)		*Late onset (N = 23)*		*Significance test*
	f (%)	*(n)*	*f (%)*	*(n)*	χ^2 *[df]*
Diseases of the nervous system	27.8	(5)	21.7	(5)	$0.20_{[1]}$
Cardiac conditions	16.7	(3)	21.7	(5)	
High blood pressure	55.6	(10)	43.5	(10)	$0.59_{[1]}$
Respiratory disease	11.1	(2)	26.1	(6)	
Neoplasms	11.1	(2)	4.3	(1)	
Endocrine/ metabolic conditions	5.6	(1)	21.7	(5)	
High cholesterol	38.9	(7)	43.5	(10)	$0.09_{[1]}$
Digestive and gastrointestinal conditions	38.9	(7)	47.8	(11)	$0.33_{[1]}$
Genito-urinary problems (urinary tract infection)	5.6	(1)	8.7	(2)	
Any eye/ear conditions	11.1	(2)	13.1	(3)	
Problems with vision (use of glasses)	100.0	(18)	87.0	(20)	$2.53_{[1]}$
Musculoskeletal/ connective tissue conditions	44.4	(8)	56.5	(13)	$3.68_{[1]}$
Pain syndrome	44.4	(8)	56.1	(17)	$0.59_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Appendix P.3.2 Current medication use

Descriptive statistics for current prescription and non-prescription medications use by early- and late-onset participants are presented in Table Q.5. Independent-samples t-tests revealed no significant differences between onset groups in prescription, non-prescription, or total medication (prescription and non-prescription) use.

Table P.5

Prescription and Non-prescription Medication Use for Early-and Late-Onset Participants (N = 41)

	Early onset (N=18)		*Late onset (N = 23)*		*Significance Test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Prescription medications used	1.4	1.2	2.1	1.8	$-1.40_{[39]}$
Non-prescription medications used	1.1	1.3	0.9	1.0	$0.40_{[39]}$
Total number of medications used (prescription and non-prescription)	2.4	2.1	3.0	2.2	$-0.75_{[39]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Appendix P.4 Psychiatric treatment history and illness characteristics

Descriptive statistics for mean age at help-seeking and illness characteristics such as illness duration and number of episodes of psychiatric illness for EO and LO groups are presented in Table P.6. Independent-samples t-test revealed no significant difference between groups in mean age at which participants report first seeking help for a psychiatric problem. A significant difference was found between onset groups for the number of episodes of a psychiatric disorder reported, with EO participants reporting a significantly greater number of episodes on average. A significant difference was also found for time since first onset of a DSM-IV disorder of any kind, and for since first onset of a DSM-IV anxiety disorder. Duration, in years, of the presenting disorder was not however found to differ between onset groups.

Table P.6

Treatment Characteristics of Early-and Late-onset Participants (N = 41)

	Early onset (N=18)		*Late onset (N = 23)*		*Significance test*
Variable	*M*	*SD*	*M*	*SD*	$t_{[df]}$
Mean age at help seeking	46.9	(18.5)	55.7	(14.2)	$-1.70_{[39]}$
Mean number of episodes	4.0	(1.4)	2.3	(1.4)	$-3.84_{[39]}$***
Duration of presenting episode of anxiety (years)	2.67	(2.53)	3.43	(4.09)	$-0.63_{[39]}$
Time since first onset of a DSM-IV anxiety disorder (years)	46.0	(7.1)	8.9	(7.6)	$16.0_{[39]}$***
Time since first onset of a DSM-IV disorder of any kind (years)	46.50	(7.94)	12.0	(11.45)	$10.8_{[39]}$***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Descriptive statistics for psychiatric treatment previously sought by EO and LO participants are presented in Table P.7. Differences in psychiatric treatment history, including psychotropic medication use were investigated using χ^2 analyses. Overall, the two groups were found to be similar with regard to psychiatric treatment history. There were no significant differences between onset groups in terms of a history of counselling or psychotherapy, past psychotropic medication use, current psychotropic medication use, nor with regard to a past history of treatment of any kind.

Table P.7

Descriptive Statistics for Psychiatric Treatment History of Early- and Late-onset participants (N = 41)

	Early onset (N=18)		Late onset (N = 23)		Significance test
Variable	f (%)	(n)	f (%)	(n)	$\chi^2_{[df]}$
Treatment history					
Psychotherapy	27.8	(5)	26.1	(6)	$0.01_{[1]}$
Medication	66.7	(12)	52.2	(12)	$0.87_{[1]}$
Any treatment (therapy and/or medications)	77.8	(14)	65.2	(15)	$0.77_{[1]}$
Current psychotropic medication use	33.3	(6)	30.4	(7)	$0.04_{[1]}$
Type of psychotropic					
Antidepressant	16.7	(3)	21.7	(5)	
Benzodiazepine	16.7	(3)	8.7	(2)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Appendix P.5 Psychiatric comorbidity

Appendix P.5.1 Descriptive analysis of current and comorbid psychiatric conditions

Descriptive statistics for the presenting psychiatric disorder and comorbid psychiatric conditions at evaluation for EO and LO groups are presented in Table P.8. Table P.8 demonstrates that over half the EO and LO groups did not meet criteria for any DSM-IV diagnosis other than GAD. There were a small number of participants in both onset groups who were diagnosed as having a primary diagnosis of GAD and secondary diagnoses of either PD, phobias or MDD (single episode and recurrent).

Table P.8

Current and comorbid psychiatric conditions for early-and late-onset participants at presenting episode (N = 41)

	Principal Diagnosis					
	Early-Onset Group (N=18)			*Late Onset Group (N= 23)*		
	GAD (n = 18)			*GAD (n=21)*	*PD (n=2)*	
Secondary Diagnosis	*f %*	*(n)*		*f %*	*(n)*	*f %*	*(n)*
No Diagnosis	55.6%	(10)		66.7%	(14)		
GAD						100%	(2)
PD	11.1%	(2)		14.3%	(3)		
Phobias	16.7%	(3)		4.8%	(1)		
OCD	5.6%	(1)					
MDD single				9.5%	(2)		
MDD recurrent	11.1%	(2)		4.8%	(1)		

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Appendix P.5.2 Descriptive analysis of psychiatric conditions at first onset of a DSM-IV disorder of any kind

Descriptive statistics for psychiatric conditions at first onset of a DSM-IV disorder of any kind for EO and LO groups are presented in Tables P.9 and P.10. For both the EO and LO groups, the majority of participants had a principal diagnosis of GAD. A small number of EO participants had OCD, PTSD and MDD (single) as their primary diagnosis, whilst MDD single and 'other' were the primary diagnoses for a small

proportion of LO participants. There were a small number of EO participants who additionally had a secondary diagnosis of GAD, PD, Phobias or MDD single. Those LO participants who met criteria for a secondary diagnosis presented with PD, MDD single and a drug-induced psychosis.

Table P.9

Psychiatric diagnoses and comorbid psychiatric conditions at onset of first DSM-IV disorder of any kind for EO participants (N = 18)

	Principal diagnosis			
Secondary Diagnosis	*GAD (n =14)*	*OCD (n = 1)*	*PTSD (n = 1)*	*MDD single (n = 3)*
No diagnosis	57.1% (8)		100% (1)	
GAD		100% (1)		100% (2)
PD	7.1% (1)			
Phobias	28.6% (4)			
MDD single	7.1% (1)			

Table P.10

Psychiatric diagnoses and comorbid psychiatric conditions at onset of first DSM-IV disorder of any kind for LO participants (N = 23)

	Principal Diagnoses					
Secondary Diagnosis	*GAD (n = 19)*		*MDD single (n = 3)*		*Other (n = 1)*	
	f%	*(n)*	*f%*	*(n)*	*f%*	*(n)*
No Diagnosis	78.9%	(15)	33.3.3%	(1)	100.0%	(1)
PD	5.3%	(1)	33.3.3%	(1)		
MDD single	15.8%	(3)				
Other*	5.3%	(1)	33.3.3%	(1)		

*Drug-induced psychosis

Appendix P.5.3 Descriptive analysis of psychiatric conditions at first onset of a DSM-IV anxiety disorder

Descriptive statistics for psychiatric diagnoses and comorbid psychiatric conditions at first onset of a DSM-IV anxiety disorder for early-and late-onset participants are presented in Table P.11. The majority of EO and LO participants had a principal diagnosis of GAD, with half of those EO participants not meeting criteria for a comorbid psychiatric condition. One EO participant each met the criteria for OCD and PTSD as their primary diagnosis, whilst two LO participants had a principal diagnosis of PD. A small number of participants in the EO group had either GAD, PD, phobias or MDD (single episode) as a secondary disorder, whilst a small number of LO participants had either GAD, PD or MDD (single) as a comorbid psychiatric condition.

Table P.11

Psychiatric diagnoses and comorbid psychiatric conditions at onset of first DSM-IV anxiety disorder for early-and late-onset participants (N = 41)

	Primary Diagnosis				
	Early –onset (n = 18)			*Late-onset (n = 23)*	
Secondary Diagnosis	*GAD (n = 16)*	*OCD (n = 1)*	*PTSD (n = 1)*	*GAD (n = 21)*	*PD (n = 2)*
No diagnosis	50.0% (8)		100% (1)	85.7% (18)	
GAD		100% (1)			100% (2)
PD	6.2% (1)			9.5% (2)	
Phobias	25.0% (4)				
MDD Single	18.8% (3)			4.8% (1)	

Descriptive statistics for participants meeting diagnostic criteria for one or more comorbid psychiatric condition at time of evaluation, at onset of first DSM-IV disorder of any kind, and at onset of first DSM-IV anxiety disorder are presented in Table P.12. χ^2 analyses revealed that onset groups were similar with regard to rates of psychiatric comorbidity at evaluation, at time of first onset of any DSM-IV disorder, and at first lifetime onset of a DSM-IV anxiety disorder.

Table P.12

Frequency of psychiatric comorbidity for current and past episodes of illness onset for early-and late-onset participants (N = 41)

	Early Onset (N = 18)		*Late Onset (N = 23)*		*Significance test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$X^2_{[df]}$
Comorbid psychiatric condition at time of presentation	44.4	(8)	39.1	(9)	$0.12_{[1]}$
Comorbid psychiatric condition at time of 1st DSM-IV diagnosis	50.0	(9)	26.1	(6)	$2.49_{[1]}$
Comorbid psychiatric condition at time of 1st anxiety disorder diagnosis	50.0	(9)	21.7	(5)	$3.59_{[1]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Summary and conclusions

As with findings for the overall sample, early-and late-onset groups were homogenous in terms of demographic and health characteristics, consistent with previous findings (Beck et al, 1996; Chou, 2009; Le Roux et al., 2005; Lenze et al., 2005). The findings for demographic characteristics using a cut-off of 50 were similar to findings using a cut-off of 34 with the exception of occupation. The finding revealed a greater number of participants in the EO group in non-professional positions, and fewer LO participants in non-professional positions than expected. It is possible that the chronic course of GAD and the long history of illness experienced by participants with EO of GAD impacted on these individuals ability to enter into or maintain jobs in the professional industry, accounting for the difference in occupational status. Occupation has not specifically been investigated amongst demographic characteristics analysed in studies of onset and late-life psychopathology, however the finding that onset groups differed with regard to occupation using a cut-off of 50 years is in contrast to the current and previous findings that EO and LO groups of older adults are alike with regard to demographic characteristics (Le Roux et al., 2005; Chou, 2009).

Early-and late-onset participants were similar in terms of the types and number of health conditions they suffered from, prescription and non-prescription medication use, including the use of psychotropic medication and history of treatment sought and

received prior to the present investigation. Onset groups were also found to differ in the number of previously significant episodes of psychiatric illness and duration, in years since onset of their first episode of anxiety, with the EO group reporting a greater number of episodes and greater history of anxiety on average. These findings are as expected given the much younger mean age at onset of first anxiety episode for EO participants, and are consistent with previous findings of late-life GAD (Beck et al., 1996; Le Roux et al., 2005).

Participants in both onset groups met criteria for a wide range of comorbid psychiatric conditions at all assessment points, namely at evaluation, at first onset of any DSM-IV disorder, and first onset of a DSM-IV anxiety disorder. The proportion of participants of participants who met criteria for one or more comorbid psychiatric condition at presentation and at onset of first DSM-IV anxiety disorder and disorder of any kind was similar for EO and LO groups.

APPENDIX Q

Descriptive Analysis of Treated and Untreated Participants

Appendix Q presents the descriptive statistics for age at onset, demographic, health, medication, treatment history and clinical characteristics of those participants who took part in the treatment programme and those who were untreated (Chapter Eleven).

Appendix Q.1 Age at onset characteristics

Descriptive statistics for age at onset of current and past episodes of illness are presented in Table Q.1. The treated and untreated participants were found to be similar in age. Comparison of means using independent-samples t-tests revealed no significant difference between the two groups in mean age at onset of the presenting episode, mean age at first onset of a DSM-IV disorder of any kind, and in age at first onset of a DSM-IV anxiety disorder. Levene's test for equality of variances was significant for these latter two variables, indicating non-equal variances for groups on these two variables. Accordingly, t values, degrees of freedom, and p values reported for these variables are based on Levene's test of equality.

Table Q.1

Age of onset characteristics for treated and untreated participants (N = 73)

	Treated participants (N = 41)		*Untreated participants (N = 32)*		*Significance test*
Variable	*Mean*	*SD*	*Mean*	*SD*	$t_{[df]}$
Age at evaluation	64.41	6.17	62.34	6.04	$1.44_{[71]}$
Age at onset of presenting episode (years)	59.24	5.95	59.03	7.15	$0.14_{[71]}$
Age at first onset of any disorder (years)	35.41	21.14	40.84	17.46	$1.20_{[70.75]}$ †
Age at onset of first anxiety disorder (years)	37.17	21.23	44.25	17.48	$1.56_{[70.77]}$ †

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

† equality of variances not assumed (Levene's test significant)

Appendix Q.2 Demographic characteristics

Descriptive statistics conducted to investigate the demographic characteristics treated and untreated participants are presented in Table Q.2. In general, the two groups were quite similar with respect to demographic background. There were no significant differences between treated and untreated participant groups in terms of gender, education or occupation, nor in terms of employment status, or employment intensity. A significant difference was found between groups for marital status. Inspection of the standardised residuals for this variable reveal that there were significantly more single participants in the untreated group than expected, and significantly fewer single participants in the treated group than expected. Given significant findings for this variable an additional χ^2 analyses was performed to investigate whether this varied by onset group. This analysis was unable to be performed for the EO group due to a cell size of less than five. Investigation of differences in marital status for treated and untreated participants classified as having LO anxiety revealed a significant difference between groups. Inspection of the standardised residuals showed that there were significantly more single LO participants in the untreated group and significantly less single LO participants in the treated group than expected ($X^2(1) = 10.47$, $p < .005$).

Table Q.2

Demographic characteristics of treated and untreated participants (N = 73)

	Treatment Group (N = 41)		*Untreated group (N =32)*		*Significance Test*
Variable	*f (%)*	*(n)*	*f (%)*	*(n)*	$X^2_{[df]}$
Gender					$0.87_{[1]}$
Male	31.7	(13)	21.9	(7)	
Female	68.3	(28)	78.1	(25)	
Ethnicity					$4.48_{[3]}$
Non-indigenous Australian	70.8	(29)	87.5	(28)	
European	17.1	(7)	3.1	(1)	
Asian	7.3	(3)	3.1	(1)	
South American	4.9	(2)	6.2	(2)	
Marital status					$12.34^{***}_{[1]}$
Single	4.9	(2)	6.2	(2)	
Married/in a relationship	85.4	(35)	46.9	(15)	
Separated or divorced	7.3	(3)	37.5	(12)	
Widowed	2.4	(1)	9.4	(3)	
Level of education					$0.06_{[1]}$
Year 8 – 'intermediate'	9.8	(4)	25.0	(8)	
Year 10 – 'matriculation'	22.0	(9)	9.4	(3)	
Tafe/trade qualification	29.3	(12)	40.6	(13)	
University degree	31.7	(13)	15.6	(5)	
Post-graduate degree	7.3	(3)	9.4	(3)	
Occupation					$1.10_{[1]}$
Professional or associate	51.3	(21)	31.3	(10)	
professional	39.0	(16)	58.9	(19)	
Higher administrative or clerical	2.4	(1)	3.1	(1)	
Tradesperson	7.3	(3)	6.2	(2)	
Non-professional					
Employment status					$3.51_{[1]}$
Employed	46.3	(19)	25.0	(8)	
Unemployed	7.3	(3)	12.5	(4)	
Retired	46.3	(19)	62.5	(20)	
Employment intensity					$3.55_{[2]}$
Part-time	26.8	(11)	15.6	(5)	
Full-time	19.5	(8)	9.4	(3)	
n/a	53.7	(22)	75.0	(24)	

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Appendix Q.3. Clinical characteristics/psychological variables

The baseline psychological variables for treated and untreated participants are presented in Table Q.8. A series of independent-samples t-tests were conducted to determine whether there were any differences between treated and untreated participants on baseline measures of these psychological variables. With the exception of the geriatric depression scale, which was completed in the initial assessment interview, five participants from the untreated group did not return completed questionnaires at baseline and were therefore omitted from analyses. As illustrated in Table Q.3, participants taking part in the treatment study were found to have significantly higher scores on measures of anxiety and anxiety sensitivity than those who did not go on to have treatment. On average, treated participants had higher scores on measures of depression, worry, and trait anxiety, and lower scores of general self-efficacy, social self-efficacy and perceptions of control over anxiety- related events than those who elected not to have treatment; however these differences were not found to be significant.

Table Q.3

Clinical characteristics of treated and untreated participants (N = 68)

Variables	Treated group (n = 41)		Untreated group (n = 27)		Significance test
	M	SD	M	SD	$t_{[df]}$
Depression	4.88	3.18	4.81	3.52	$-0.08_{[71]}$
Anxiety	13.59	4.65	11.00	5.14	$-2.15_{[66]}$*
Worry	62.05	9.53	57.59	11.23	$-1.76_{[66]}$
Trait anxiety	50.61	9.97	48.59	8.81	$-0.85_{[66]}$
Anxiety sensitivity	33.71	13.9	24.93	12.33	$-2.73_{[66]}$**
General Self-efficacy	52.32	12.09	55.59	9.66	$1.18_{[66]}$
Social Self-efficacy	17.85	4.48	19.15	3.76	$1.24_{[66]}$
Perceived control of anxiety	69.63	17.65	71.88	17.93	$0.51_{[65]}$

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.